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Textile World

DECEMBER, 1955

Report on

COTTON CRUSHPROOFING

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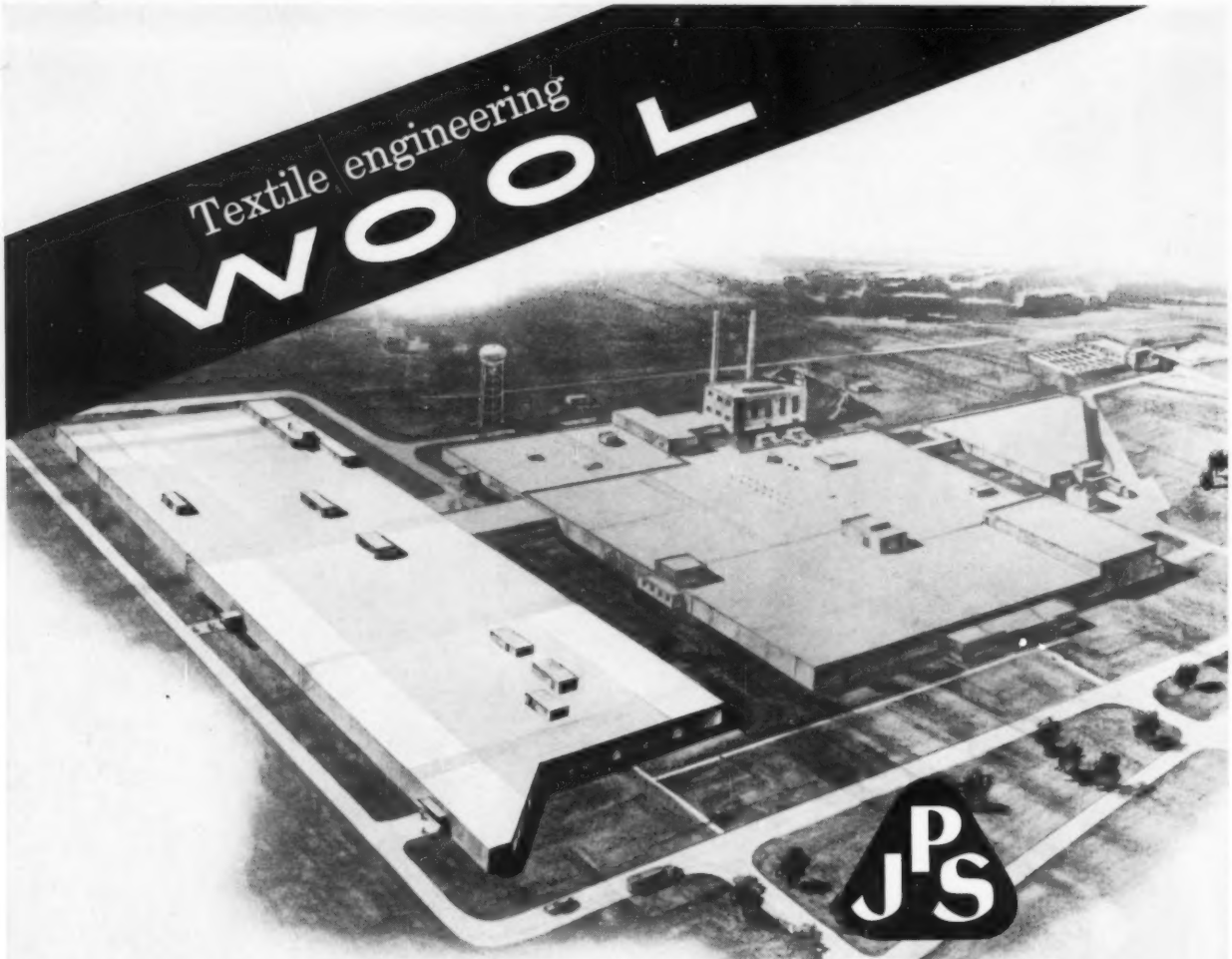

J. P. Stevens & Co., Inc.
Dublin Plant, Dublin, Georgia

Textile engineering for leaders in the woolen industry has long been a major activity at Robert & Company Associates. The new woolen plant of the J. P. Stevens & Co., Inc., now underway at Dublin, Georgia, is another of many projects designed by our company for other great names in the field, including the Peerless Woolen Mills, James Lees & Sons Company, Fieldcrest Mills, Inc., and others.

Occupying 200,000 sq. ft. the completely new air conditioned mill for J. P. Stevens & Co., Inc. will be one of the most modern in the industry. Its production of high quality woolens for men's, boys' and women's apparel will be in keeping with the firm's reputation for *Fine Fabrics Since 1813.*

Calling on experience gained in over 40 years, our Textile Engineering Division is especially qualified to provide layouts and designs for all types of projects related to the textile industries.

Regardless of the size or nature of your project, Robert & Company Associates is ready to serve you promptly and finish on schedule *within the budget.*

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Textile Engineering Division
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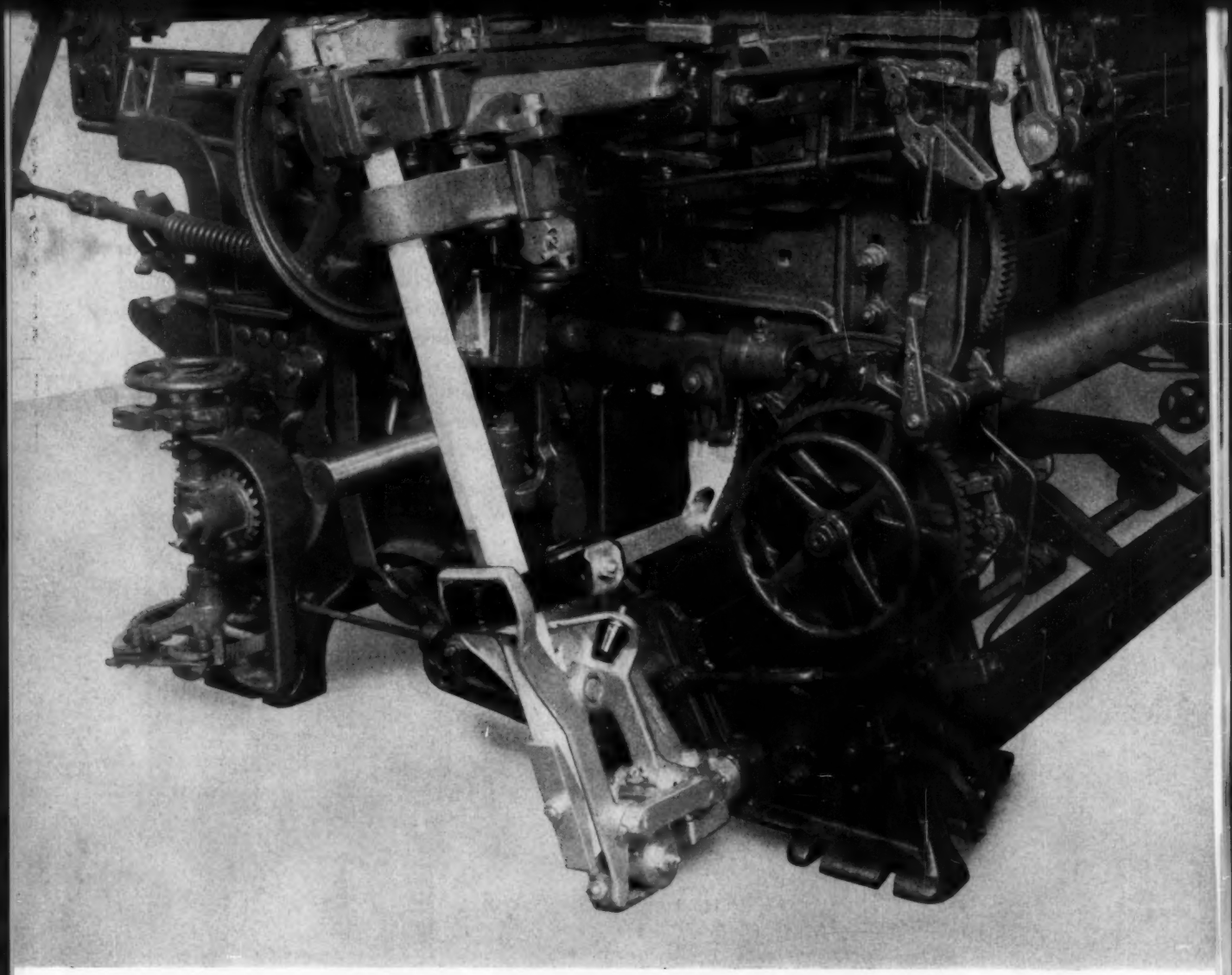

NEW DRAPER LINKAGE PARALLEL ASSEMBLY IMPROVES LOOM OPERATION . . . CUTS MAINTENANCE COST

Extensive mill trials prove the Draper Linkage Parallel Assembly results in a more uniform, controlled picking action. This parallel assembly eliminates "jump" and "play" in the picker stick . . . improves overall loom operation and reduces wear on pick motion and parallel parts.

A fixed power block position allows more uniform power settings to be maintained. Clamp-fit of the assembly on the rocker shaft permits easy, fast application. *Picker sticks may be replaced without altering Parallel settings.*

The new aluminum pick arm and lug strap connection (illustrated), while not required with the above application, is recommended.

For complete details on this *cost* and *labor saving mechanism,* contact your nearest Draper representative or write:

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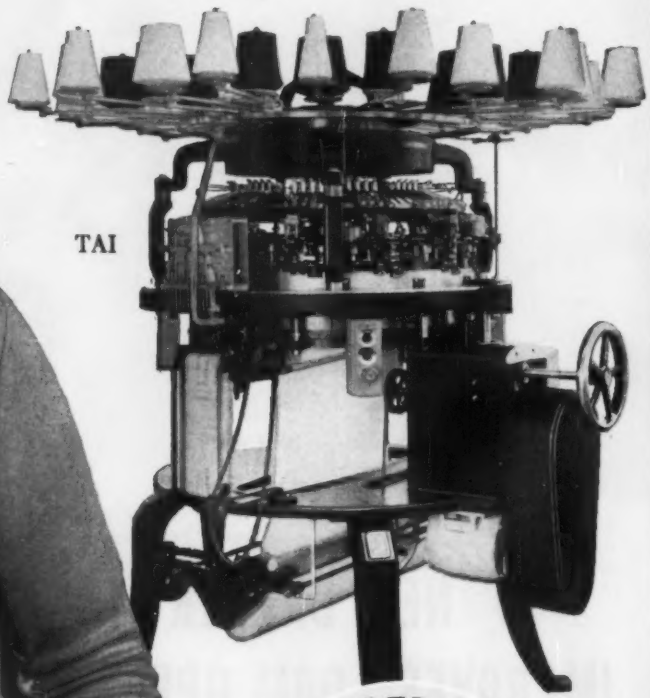
Casual Elegance with "CIRCULAR JACQUARD"

The TAI, most popular Circular Jacquard Knitting Machine, offers maximum efficiency and versatility in the production of finer, softer fabrics.

Designed for interlock stitch, the TAI is also recommended for jersey, reverse jersey and rib bodies, all with *knit-on cuff*.

Cuts of up to 16½ needles per inch are possible on the 30" diameter model. Fully automatic, multi-feed, the Circular Jacquard TAI offers the maximum in quality and versatility for *true interlock* and jersey fabrics.



TAI

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The Jacquard Knitting Machine Co. Inc
Philadelphia · Pa.
U·S·A·

the world's largest manufacturers of circular jacquard knitting machines

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Textile World

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Developments To Watch

JAPAN HAS JITTERS . . . for fear her U. S. bonanza won't last. They're saying it's not true that they're selling many textile goods to the U. S. They'd have it believed that most of the stuff coming to the U. S. is for transshipment to Indonesia and other parts.

Word is that "cottage factories" are springing up all over in Japan, particularly in garment making—from Japanese cloth. Production capacity has doubled since exports to U. S. started.

Official U. S. line last year was "we have to help Japan's tottering textile industry." Nothing was said about increasing it.

$1 MINIMUM WAGE . . . will hit many mills. Hardest hit will be cotton sales-yarn mills and circular knitting mills. Hesitant to admit it, a third or more of these mills will have to make wage adjustments. Many, already close to the minimum, may have to raise across the board, or close to it. They can't afford to narrow the gap between skills much further.

"COLOR YOUR OWN GARMENTS" . . . may become a trend next spring. Taking a cue from children's coloring books, Riegel Textile Corp. is now printing picture outlines on children's-wear fabrics and supplying a fill-in kit containing four colors and two brushes. The child fills in the pattern, and mother irons it on the reverse side to fix the color. The fabric and color are washable. Promotion will be tied in with TV personalities.

COATED NYLON . . . for tarpaulins will reach $50-million worth a year if manufacturers "sell the canvas habit" for five years. So says Amos H. Griffin, Amerotron vice president. Coating is neoprene. Fabric weight for heavy-duty tarps is 5 oz., coating 2½ oz. on each side—total 16 oz. per sq. yd. Main market is 100,000 trucks now tearing around the country with tarp covers. Trick is to broaden uses and hang on to expanding present uses.

"ME TOO," SAYS INDIA . . . who also wants a hunk of the "ready market in the U. S." The Indian government plans to "step up exports to the dollar area, particularly textiles," with the help of "U. S. experts." A vice president of Macy and a fashion expert have been beating the bushes in India to find handmade, handwoven garments plus a million yards of handwoven madras. And a U. S. "specialist" is surveying the Indian textile industry.

Looks as though Japan might have some competition for the U. S. market.

GOOD BUSINESS . . . for the next six months, J. Spencer Love, chairman of the board, Burlington Industries, predicts. There will be full-time employment and better mill-profit margins. His own company has a sales target of 15% in major areas and a 50% increase in over-all earnings.

NONWOVEN FABRICS . . . "hottest thing in textiles," will reach 250-million pounds in 10 years, enthusiasts say. It was only 25-million in 1953. These bonded-web fabrics are already finding such apparel uses as shoulder pads, shoe linings, waistbands, coat linings, even skirts. All fibers are used, even filament.

MILL PRICES UP . . . spurred by present inflation spiral, largely set off by wage increases everywhere. But mill costs are also up everywhere except in fiber. For instance, kniting mills expect to pay 7% more for cotton yarns, 10% more for supplies, 7% more for packaging material.

By mid-October, mill prices were on their way. Dyers and finishers raised about 10%, printers about 8. Burlington pushed up rayon sheers and gabardines 2½¢ a yard.

Only market demand makes increase possible. Some goods, selling slow, have to take it on the chin. With Japan now in the U. S. market and all costs up, marginal operators will have more trouble than ever.

TUFTED FABRICS . . . should find a good market in furniture upholstery. New machines can create high-and low-pile effects, and use of different yarns permits several colors in one dyeing operation.

CONTINUED ON PAGE 6

TEXTILE WORLD. Published monthly, with an additional issue in September, by McGraw-Hill Publishing Co., Inc. Executive, Advertising, and Subscription Offices: 330 W. 42nd Street, New York 36, N. Y. Editorial Office: 201 E. Coffee Street, Greenville, S. C. Publication Office: 99-129 North B'way, Albany 1, N. Y. Second-class mail privileges authorized at Albany, N. Y. **For subscriptions,** write to: TEXTILE WORLD Subscription Service, 330 West 42nd Street, New York 36, N. Y. **State company and position. Subscriptions are solicited only from executives, engineers, and technicians in textile manufacturing or finishing plants.** Single copies 50¢. United States and Possessions and Canada, $2 for 1 yr.; $3 for 2 yrs.; and $4 for 3 yrs. Other Western Hemisphere and the Philippines, $10 for 1 yr.; $16 for 2 yrs.; and $20 for 3 yrs. Other Countries, $15 for 1 yr.; $25 for 2 yrs.; and $30 for 3 yrs. Printed in USA. Annual index in Jan. issue.

FULL-FASHIONED GIRDLES . . .

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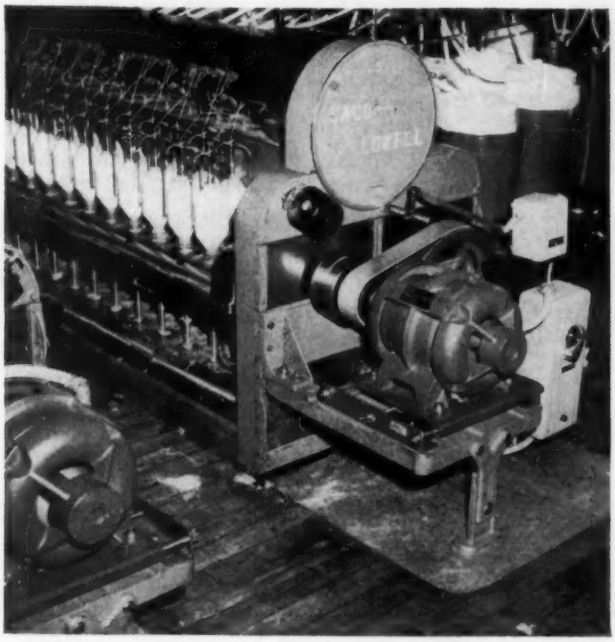
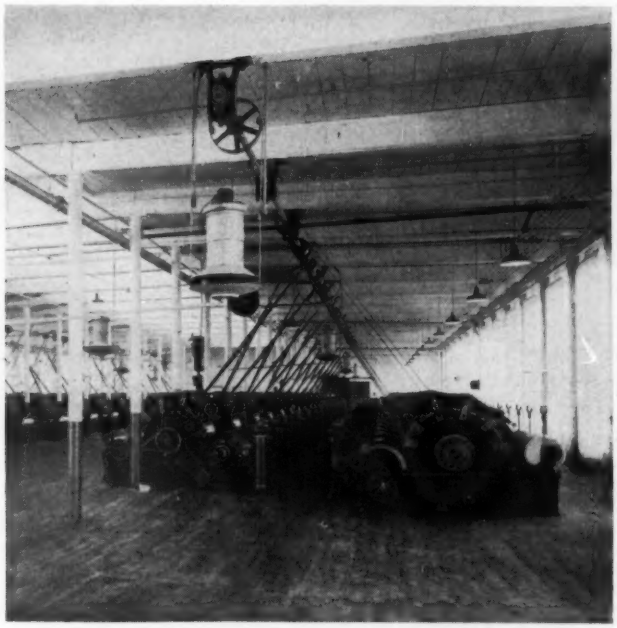


Smooth Start-up Eliminates Broken Ends, Increases Production of Roving Frames!

This short center drive with its Tannate Flat Leather Belt, automatic spring-tension motor base and Bethlehem slip ring starter not only starts the frame so smoothly that it has eliminated broken ends, but also maintains constant speeds increasing production. This is one of 24 drives which were designed and engineered by J. E. Rhoads and Sons for a prominent New England textile mill. Several of them have been running for more than five years and have proved their ability to produce top quality yarn economically. *Rhoads Engineering Service* . . . You too, can take advantage of Rhoads Engineering Service when you are planning new drives or changing old ones. Rhoads Engineers are specialists in the field of mechanical power transmission.

planning new drives or changing old ones?



Rhoads Gilt Edge Belts driving cards efficiently, economically.

RHOADS...Your Best Buy in Belting...

Whether your machines are driven from individual motors or from a line shaft such as the card room shown on the right, Rhoads belting can often help you obtain more production and lower your belting costs.

As tanners, curriers and manufacturers of such well-known brands as Tannate, Gripotan, Gilt Edge and Powerhold, you can be sure that Rhoads has the belting and the "know how" to economically solve almost every drive condition in your mill.

Remember, Rhoads belting costs less to run and maintain.

Why not take advantage of the experience Rhoads has had in the production and application of flat leather belting? It is a service offered to you without charge.

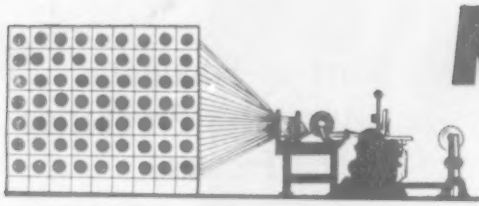
2100 W. Eleventh St., Wilmington 99, Delaware

RHOADS
INDUSTRIAL LEATHERS

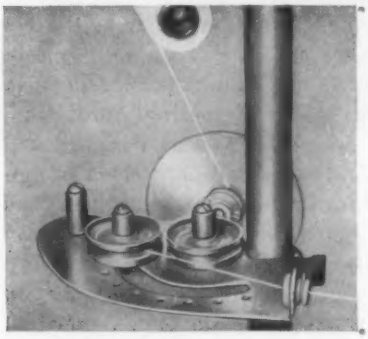
ATLANTA • NEW YORK • CHICAGO

In roller chain... EXTRAS* like these

*Extras at no extra cost

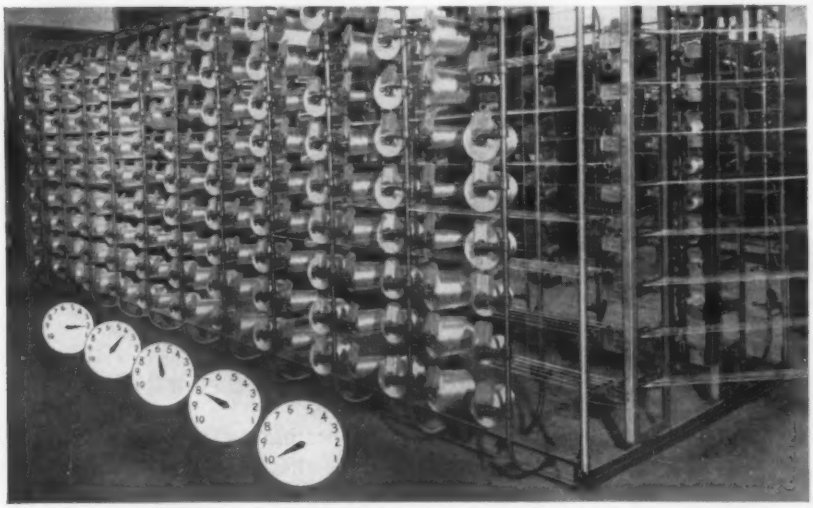


McBRIDE CREEL CORNER



AT LAST— YOUR YARN TENSION CAN NOW BE EVENIZED AT THE BEAM

McBride Tension-Master



Note how settings change to evenize yarn tension at the beam.

Warping of light yarns such as 15 denier nylon requires special attention to tension settings. Yarn originating at the front of the creel will have 5 to 7 grams less tension per end than will yarn starting at the rear of the creel that has passed through the intermediate guides. This tension variation must be evenized at the beam for better warping and better fabrics.

McBride Tension-Master provides a wide range of settings to evenize the warp tension. Visual control is simplified because a glance checks an entire row of units.

The Tension-Master is standard on all McBride creels and is available with anti-snarl, transparent, plexi-glass shield. Greater ranges of tension are possible by adding flat, steel, washer-type weights to the tension discs. Discs are available in mirror or satin finishes and in weights from 15 to 170 grains.

CREELS *for every purpose,* CONE HOLDERS, STOP MOTIONS, TENSION CONTROLS, WARP BEAMS, FLANGES, CARPET INSPECTION TABLES, METAL AND WOOD ROLLS.

COMPLETE ENGINEERING SERVICE IS PART OF EVERY McBRIDE INSTALLATION

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FULL-FASHIONED GIRDLES . . . can be made successfully on 45-gauge full-fashioned knitting machines with fine cotton-covered rubber yarns. According to Textile Machine Works' 1954 Statistical Survey, there are still a few of these machines left. They will be busy if figure-and-fashion-conscious girls take to the idea of full-fashioned girdles.

MIRACLE WOOL? . . . A method of setting wool fibers by treating them with a ninhydrin and sodium sulfite mixture at 50° C. may give wool sales an added push. The first example of setting with a mixture of an oxidizing and reducing agent, this method gives a highly permanent set. Prospects look good for washable woolens with permanent pleats.

DYEING . . . particularly of hydrophobic fibers, may be revolutionized by ultrasonics (high-frequency sound). Bombardment of fiber surfaces with dye particles in a solution vibrating at 20,000 cycles per second is expected to reduce dyeing time from hours to minutes. Full-scale apparatus is about ready for field trials.

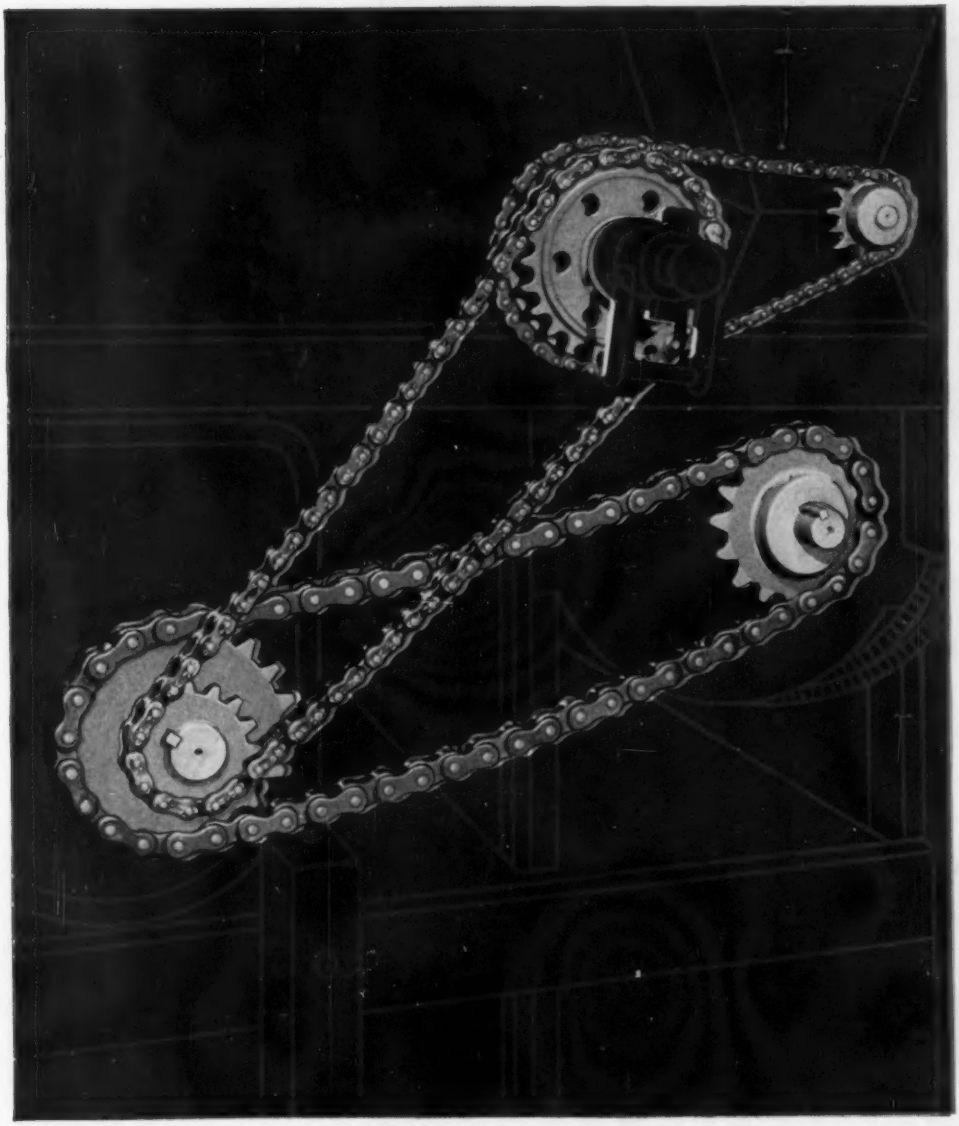
NEW SILICONE FINISHES . . . will be a boom to fabrics that go into work uniforms. Silicones form an invisible, water-repellent film that causes water and water-borne stains to roll off. Oil and grease spots wipe right off without leaving a solvent ring.

EXPANDABLE SLEEPERS FOR CHILDREN . . . will aid many a household budget next year. P. H. Hanes Knitting Co. is bringing out an all-cotton Merrichild Grow-A-Year sleeping garment with an extra row of fasteners at the waist, laminated slipper soles, and flexible ankles.

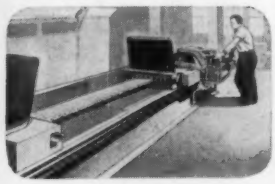
GLASS-FIBER FABRICS . . . called Rovcloth, are now being woven directly from roving. Advantages claimed include increased strength, better wetting-out of individual filaments, lower cost, better interlaminate strength, increased bulk, and no loss of strength caused by heat-cleaning or multiple-handling operations.

CLOSED-CIRCUIT TELEVISION . . . will play a large part in process control, supervisory techniques, materials handling, and traffic control in textile plants. New advances in television engineering make TV practical, even in color, at much lower

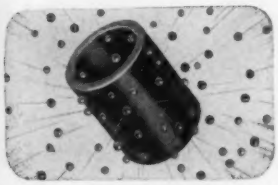
In roller chain . . . EXTRAS* like these give you extra reliability



LOCK-TYPE BUSHINGS (applied on a range of sizes) end a cause of stiff chain.



PRE-STRESSING of multiple width chain provides uniform load distribution.



SHOT-PEENED ROLLERS have greater fatigue life, added ability to withstand impact.

CLOSER HEAT-TREAT CONTROL — coupled with rigid testing insures uniformity.

*And you pay no premium for these LINK-BELT extras

BIG reason why Link-Belt Precision Steel Roller Chain is first choice for so many tough jobs is that it has *extra reliability built-in.* For example, pre-stressing smooths out any irregularities of multiple width chain *in advance.* And it's just one of many *extras* you get as *standard* from Link-Belt. Check the three others shown here. Then call the Link-Belt office or authorized stock carrying distributor near you for facts on Link-Belt's complete range of roller chain and sprockets. Data Book 2457 gives full information on single and multiple widths, in ¼″ to 3″ pitch, 1″ to 3″ double pitch. Ask for your copy.

LINK-BELT

ROLLER CHAIN & SPROCKETS

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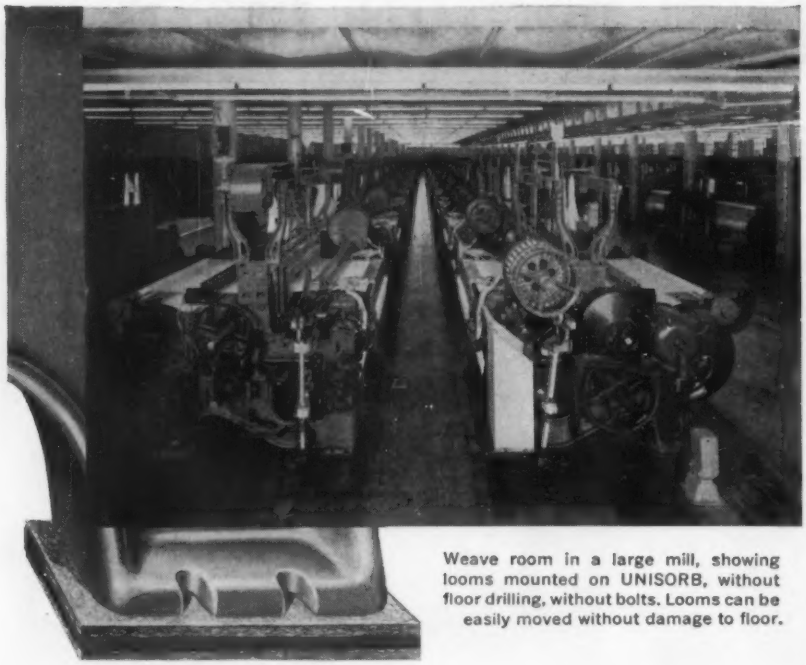

Weave room in a large mill, showing looms mounted on UNISORB, without floor drilling, without bolts. Looms can be easily moved without damage to floor.

Another Textile Mill Mounts Looms on

UNISORB®

You can now get these advantages by mounting all kinds of textile machines on UNISORB pads:

- 10% to 20% saving of installation labor
- no drilling of wood or concrete floors
- reduce vibration 60% to 85%
- increase machine efficiency and life
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For the facts about these advantages, including increased efficiency of machines and workers, return the coupon for your copy of the UNISORB Textile Machinery Booklet. It's free, and you're under no obligation.

Look for the red center and UNISORB brand mark

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RETURN COUPON NOW! Please send me a copy of the booklet "Why It Pays to Anchor Textile Machines on UNISORB".

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light intensities than was previously possible.

NEW USES FOR TERRY CLOTH . . . in products other than towels will take 25% of the production in 1955, compared with 2% in 1947. Uses fast gaining in popularity include fabrics for automobile seat covers, curtains, couch covers, and aprons. The latest thing is terry-cloth coveralls to protect Air Force ground crews while refueling jet fighters.

ACID-RESISTANT CLOTH . . . of 100 Dynel will be the future uniform cloth for members of the Armed Forces engaged in hazardous activities. The material was tested for more than a year at Picatinny Arsenal before approval, according to Army spokesmen.

Letters From Readers

What's on your mind?

We welcome your comments. Whether you agree or disagree, with us or anybody else, we will be glad to have you air your views.

Unless you ask us not to, we will use your name and company connection when your letter is printed. If you prefer to have your opinions appear unsigned, we will respect your confidence by using only a set of initials.

Write to Editor, Round Table, TEXTILE WORLD, 330 W. 42nd St., New York 36, N. Y.

YARN-SPEED METER

Dear Editor:

In the story "New Methods to Control Knit-Fabric Quality," [TW, Aug., '55, p. 110] the firm of Cooper & Roe Ltd. was mentioned in the text as using the yarn-speed meter but the

BRUSH TEXTILE INSTRUMENTS

picture of the meter in use was taken

OPEN THESE DOORS TO SPINNING PROFITS

Shown below is head end of Roberts Model 55R High Draft Spinning Frame.

AVAILABLE IN THE FOLLOWING FORMS:

- *Partial or complete changeovers on mill's existing frames.*
- *Completely modernized Model 55R Roberts High Draft Spinning in 3", 3¼", 3½" or 4" gauge.*
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- **LARGER ROVING PACKAGES IN CREELS**
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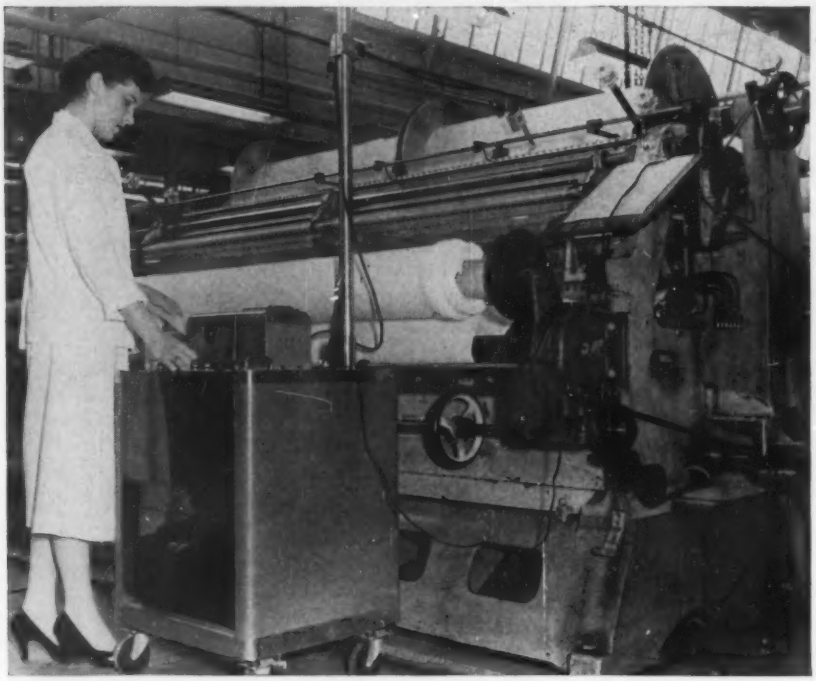

Brush Tension Analyzer helps American Viscose improve textile processing

This test setup on a tricot knitting machine at Avisco's Textile Research Dept. utilizes a Brush Analyzer to measure tension on viscose dull yarn. The Analyzer measures and permanently records on graph paper both static and dynamic tensions from 1/10 to 400 grams in filamentary materials.

Mounted on casters, the unit can be used in research, or easily rolled to various production machines. It improves quality control and reduces costs by indicating trouble spots due to improper tension. For information on how Brush Textile Instruments can help *you*, contact our Southeastern Office or write Brush Electronics Company, Department Q-12, 3405 Perkins Ave., Cleveland 14, Ohio.

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picture of the meter in use was taken at Cooper Bros. Ltd., Nottingham.

W. A. DUTTON
Deputy Director of Research
Hosiery & Allied Trades Research Assn.
Nottingham, England.

[Many readers have inquired about the availability of the yarn-speed meter. The meter is covered by world patents, and its use is reserved to members of the Hosiery & Allied Trades Research Assn. A similar British device that we believe can be used on knitting machines was illustrated in TW, Oct., '55, p. 162.

The yarn-measuring instrument described in "Better Control for Knit-Fabric Yield" [TW, Oct., '55 p. 123] was invented by John Hamilton and is under patent application.—EDITOR]

LET'S CONSULT THE REAL EXPERT—THE OPERATOR

Dear Editor:

I am a comparative newcomer to the textile industry; but I have heard my father and many of the so-called old-timers say that "if you watch the little things, the big ones take care of themselves." This philosophy can be applied to all phases of the industry.

Many times I have heard overseers, superintendents, and other top manufacturing men put off an operator with an idea he is trying to put across. But the operators are the ones who work with the machinery. They are the ones who are directly responsible for the quality of the yarn, dyeing, or fabrics that you produce.

The thing that surprises me most is that the big companies like Burlington are the ones that pay most attention to their operators' suggestions, while the small independents are usually the ones that don't encourage this type of help and even in some cases actually discourage it.

For the past several years, I have been in a position to observe both the customer and the manufacturer, including the operator. During this time, I have been sent as the manufacturer's representative to try to clear up various complaints and was very much surprised to find out how little the top supervisors or the manufacturers knew about the methods their operators were using. In 90% of these complaints, a talk with the operators involved cleared up the trouble.

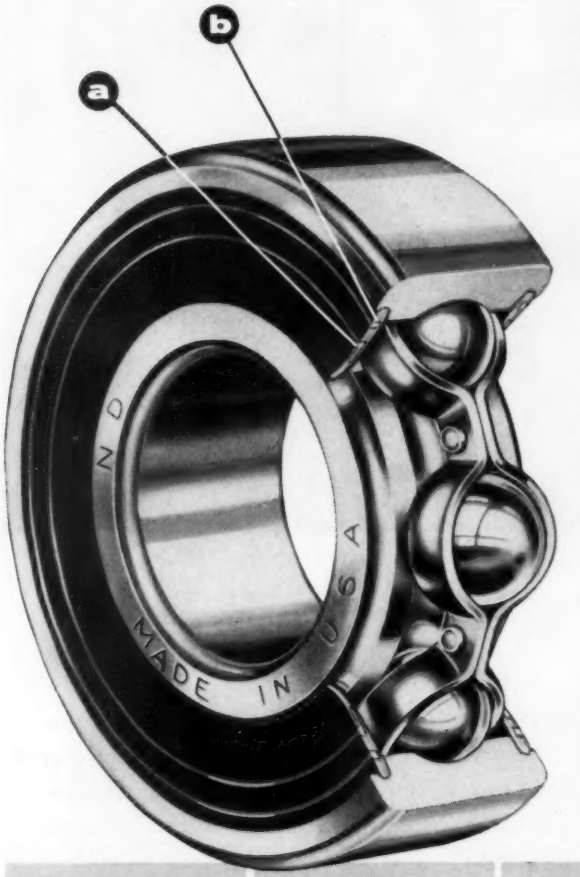
Small mills can profit from following the big companies' lead. Make use of your workers' know-how. Put up a suggestion box. Hold weekly or

CONTINUED ON PAGE 198

FACTS

about

NEW DEPARTURE
BALL BEARINGS



New Sentri-Seal...on guard against dirt and wear!

The unique design of the Sentri-Seal gives optimum protection against dirt, and includes a number of other major advantages.

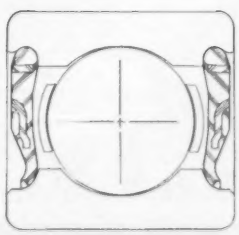
Sentri-Seals are quickly removed, easily replaced. As the seal is of synthetic rubber, in which two metal rings are embedded, a constant-rate spring is created between the rings. Inherent flexibility prevents distortion of the bearing outer ring due to seal insertion, permitting the use of bearings to the higher accuracy specifications. The spring action maintains an efficient sealing contact with the bearing ring to bar dirt and retain lubricant. Sentri-Seals are relatively inert to oils and greases and operate satisfactorily through a temperature range of −40°F to 225°F. Specifications available for still higher temperatures. In applications where relubrication is desired, it is easily accomplished by the injection method.

The New Departure Sentri-Seal basically consists of two separate metal rings, "A" and "B", embedded in synthetic rubber, resulting in a spring which absorbs distortion and deflection. The seal is not drastically influenced by axial displacement due to bearing end-play within prescribed tolerances, and provides efficient sealing at low torque. Bearing shown is equipped with two seals.

ONE SENTRI-SEAL | SEAL AND SHIELD | SEAL AND SNAP RING | TWO SEALS AND SNAP RING | SEAL, SHIELD AND SNAP RING

The diagram shows in section the New Departure Sentri-Seal. Lip contacting surfaces are form-ground simultaneously with the ball race, giving an extremely high degree of concentricity between sealing surfaces and the raceway.

Sentri-Seal is available for a range of sizes in single-row, standard-width bearings and also in two types of New Departure adapter bearings. Sizes, dimensions and capacities are listed in the latest New Departure catalog.



Write for full details on Sentri-Seal

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Experimental lab with the right atmosphere

The A. French Textile School at the Georgia Institute of Technology in Atlanta, founded in 1899 to train textile engineers and administrators, is recognized today as one of the nation's foremost experimental schools.

Here, the subject of air conditioning in textile manufacture is truly "academic". For here, new manufacturing techniques are tried out and old ones re-tested. To provide the exact atmosphere needed for student experiments, an Amco Central Station Air Conditioning System is in operation. This complete AMCO system is invaluable. It mixes fresh and recirculated air, in proper proportions; delivers it to the work area, neither too "wet" nor too "dry" . . . but always at the proper degree of moisture and temperature for work in progress.

Over the years, the name AMCO has stood for leadership and outstanding quality in the manufacture of air conditioning systems. There is an Amco System to fit every need. An Amco engineer will gladly discuss the merits of the various systems available to you. Or, write for free copy of "Air Conditioning for the Textile Industry".

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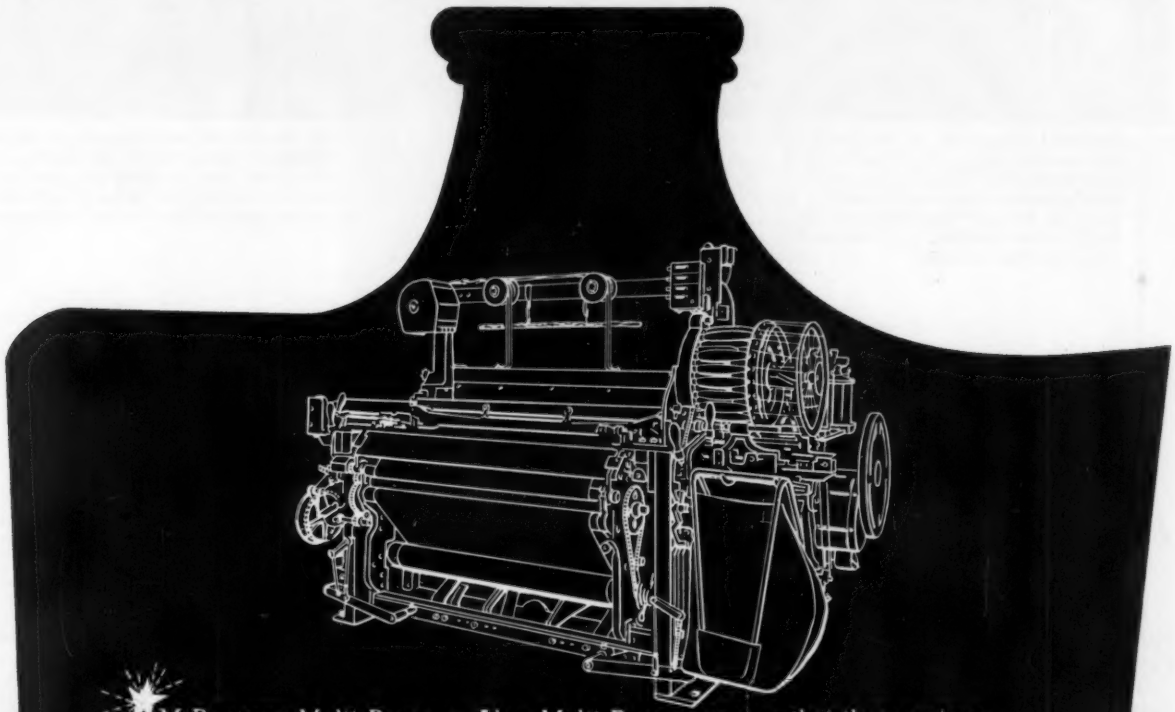

M-P means Multi-Purpose. Also, Multi-Purpose means that these unique looms can be quickly converted, *right in your mill*, for equally efficient operation on plain or fancy fabric constructions, according to the swiftly changing dictates of fashion. *So see C & K today.*

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Unirail® Uptwisters in this leading mill were installed as the result of a Leesona Profit Factor Study. Replacing old uptwisters, they are more than living up to expectations. The mill reports an increase of operating effectiveness 10% higher than the increase originally indicated by the Profit Factor Study. Most efficient uptwisters ever built, Unirails produce 2 lb. headless packages . . . cut handling time as much as 30%. Whether your requirements call for uptwisting or other winding or twisting operations, replacement of old equipment with modern Leesona machinery may be what you need for more efficient, more economical production. A Leesona Profit Factor Study will give you the answers to this and other production problems.

Double-profit service you should know about

Here's how expert analysis can help you find your Profit Factor

Right now, many a textile mill is cashing in on its hidden profit potentials — revealed by a Leesona Profit Factor Study.

This is a detailed, *confidential* study of a mill's twisting and winding operations — and related operations — followed by a complete, expert analysis, with recommendations as to just where and how the greatest savings may be made.

Supplementing these Studies, Universal offers the Leesona Pay-As-You-Profit Plans, designed to help mills strengthen their competitive position while safeguarding their capital and borrowing power. These plans provide for either long-term purchase or long-term lease of Leesona twisting and winding machinery.

Together, Leesona Profit Factor Studies and Pay-As-You-Profit Plans comprise the Leesona Double-Profit Service. This folder describes how you may use either feature of the Service to advantage — or how you can profit two ways by combining them. Send for your copy today. This service is available in the U. S. only.

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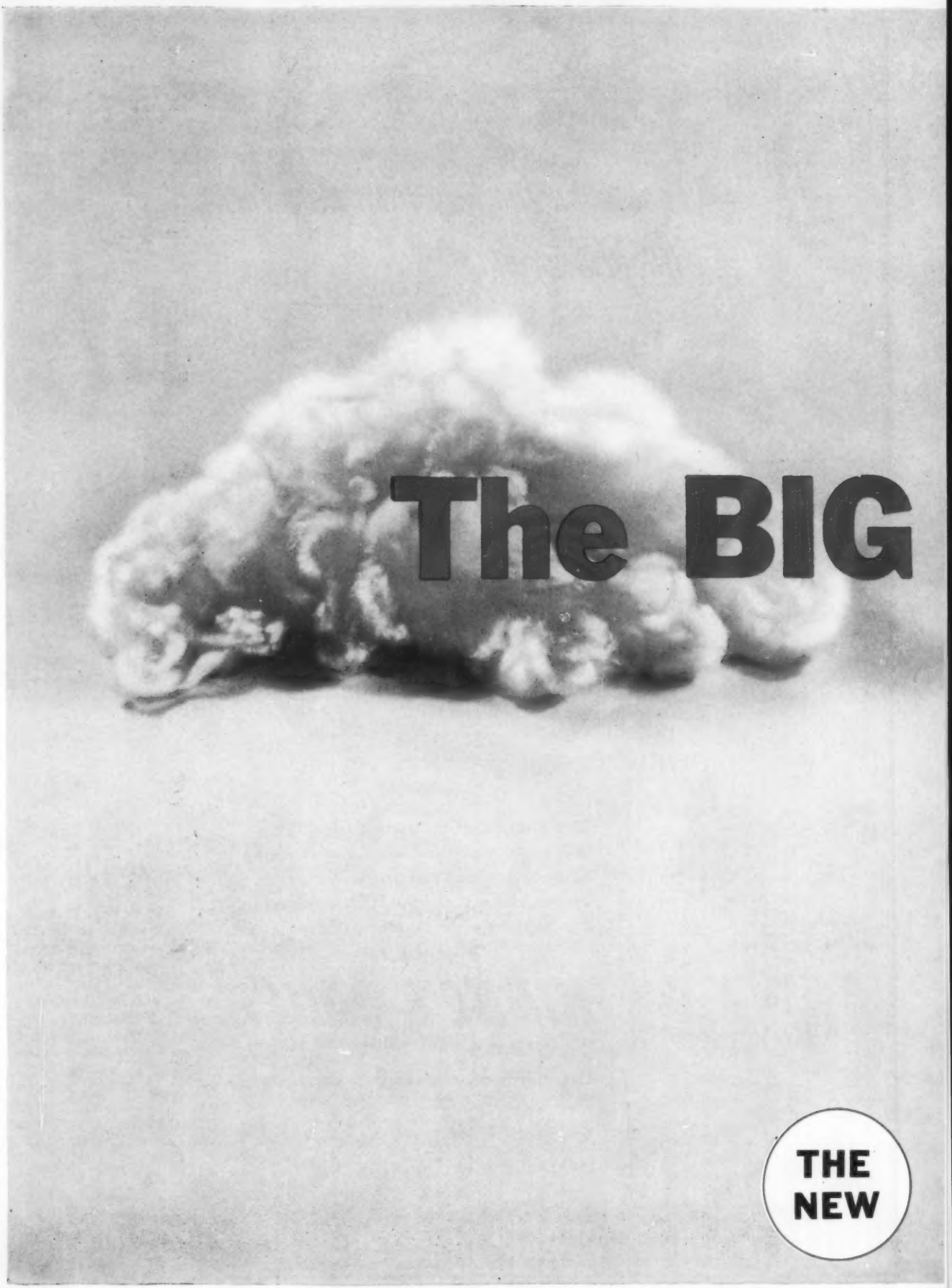
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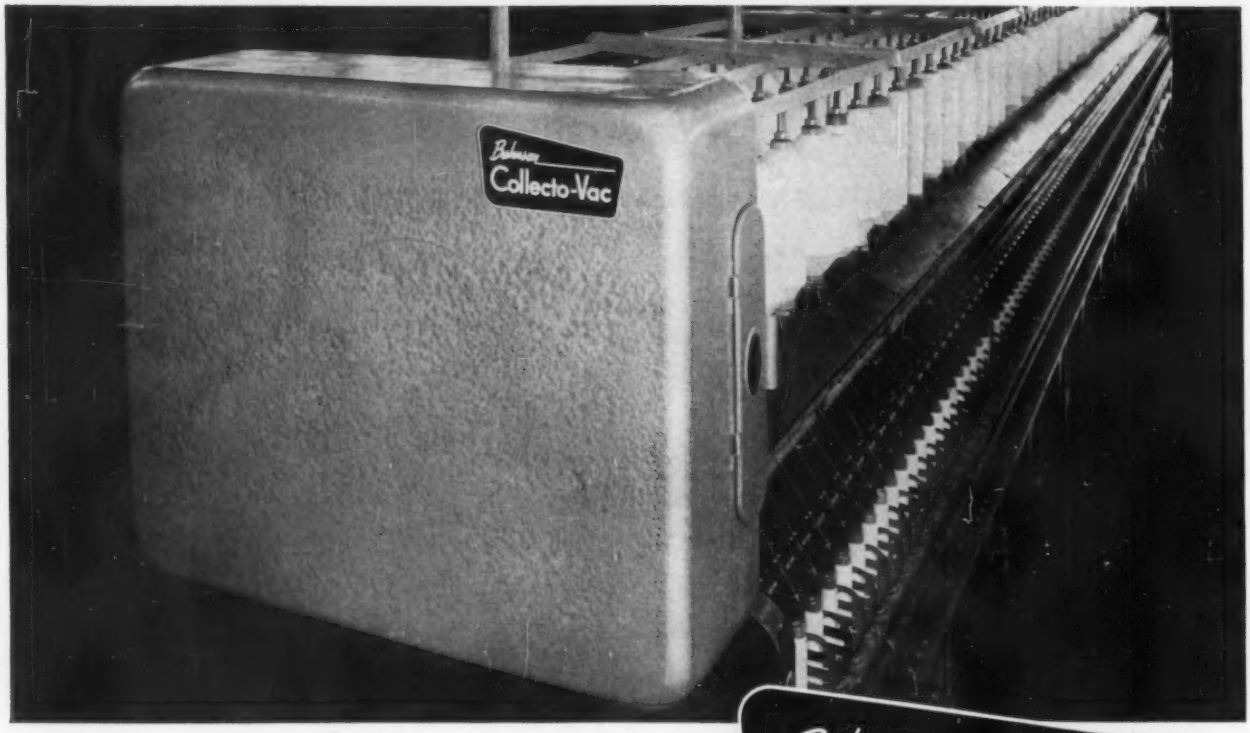
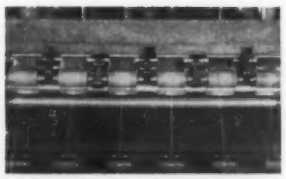
Important savings and greater efficiency in automatic broken-end collection

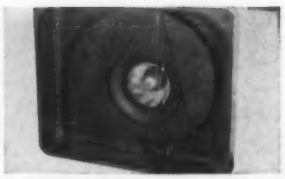


with the NEW Bahnson Collecto-Vac



Durable aluminum flutes

Anodized aluminum flutes *eliminate flute warpage* and minimize static electricity build-up on the smooth collecting surfaces.



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Specially engineered main duct gives maximum pressure distribution throughout system utilizing a Bahnson designed fan for high air handling efficiency.

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Vacuum sealed doors on each end of collection box facilitate operation, save time and money.

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Collection ducts and flute connecting tubes are completely air-tight due to specially compounded seals at tube joints. Efficient suction performs double duty, too, in lint and fly recovery.

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Of the nation's 100 top textile manufacturing firms, 91 are users of Bahnson equipment!

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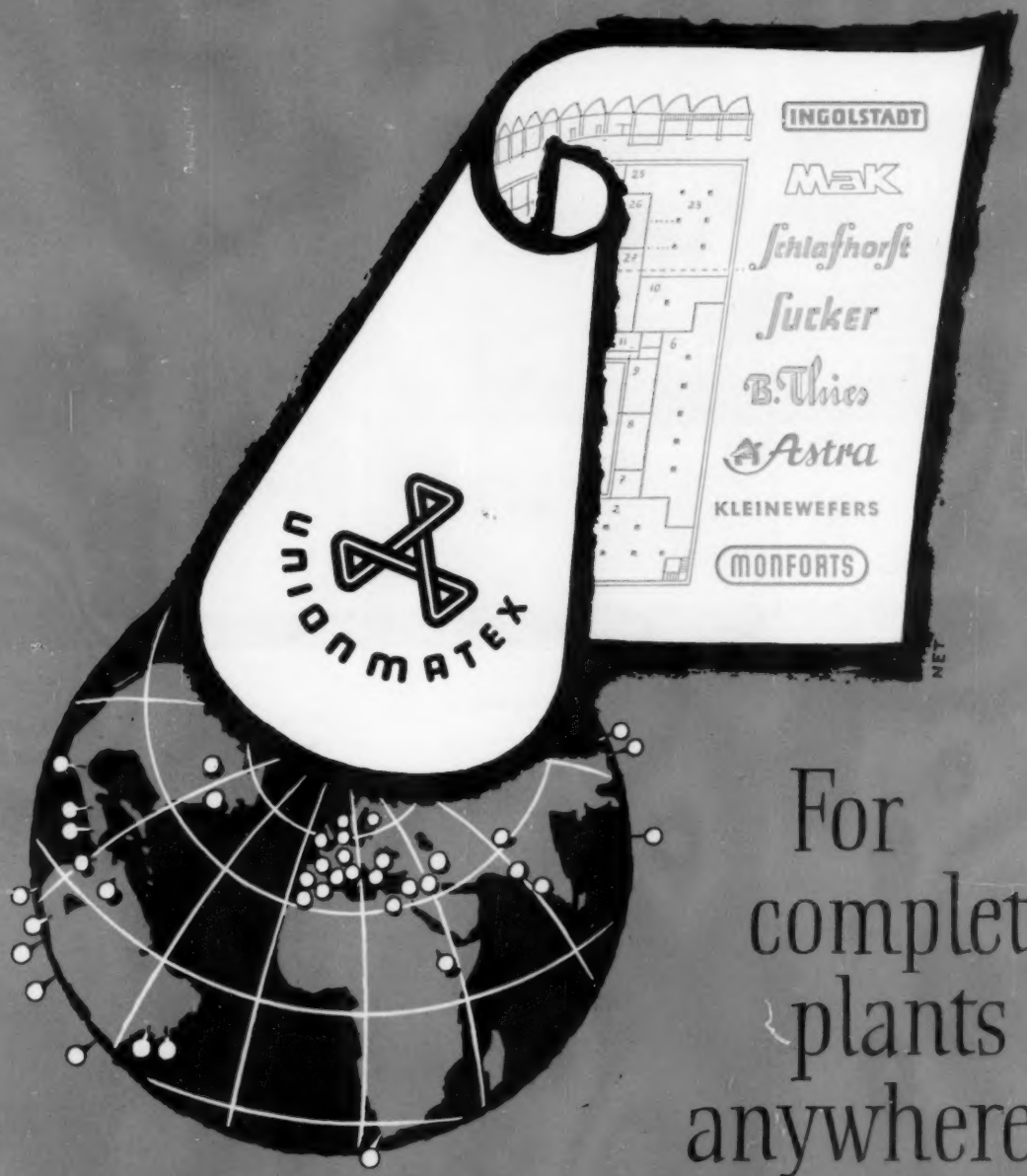

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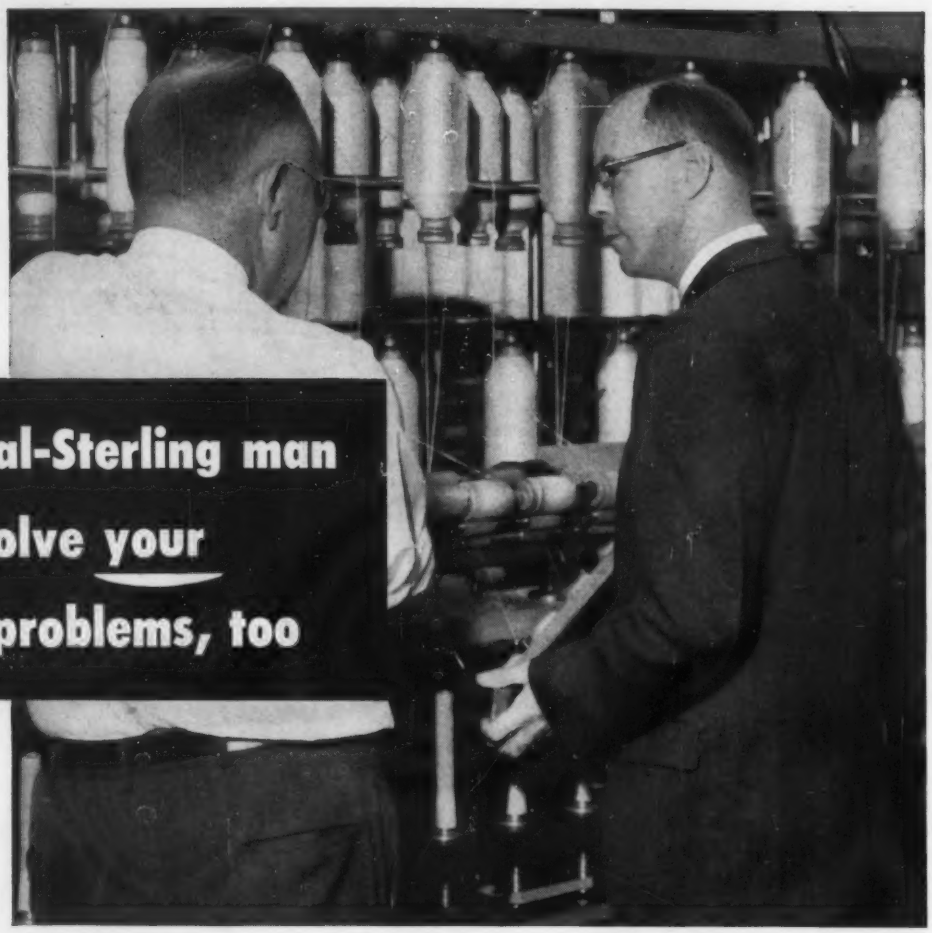

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THANKS to treatment with Hycar Latex—a new process discovery—you can wash these new denims in the same washer load with whites. What's more, they wear longer, they're softer, they keep their "new goods" feel and appearance much longer than ordinary denims.

Look for "Hycar-Sized" on the label when you buy. Write Dept. CM-6, B. F. Goodrich Chemical Company, Cleveland 15, Ohio for names of manufacturers.

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THE NEW WIESNER-RAPP
Multi-Stage Washer

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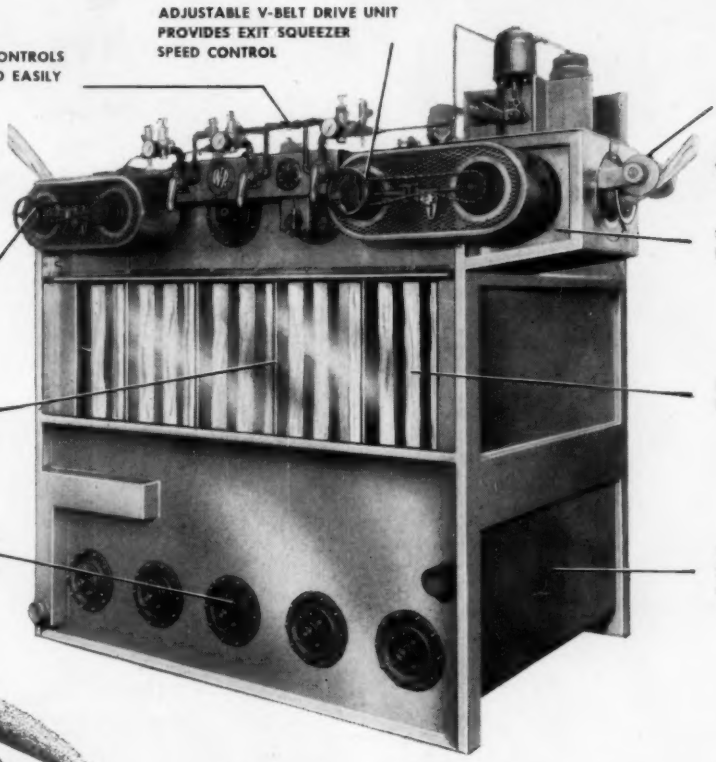
VERSATILE... COMPACT... ECONOMICAL... ACCESSIBLE


ADJUSTABLE V-BELT DRIVE UNIT PROVIDES EXIT SQUEEZER SPEED CONTROL
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EXTERNAL ANTI-FRICTION BEARINGS WITH MECHANICAL SPRING LOADED SEALS
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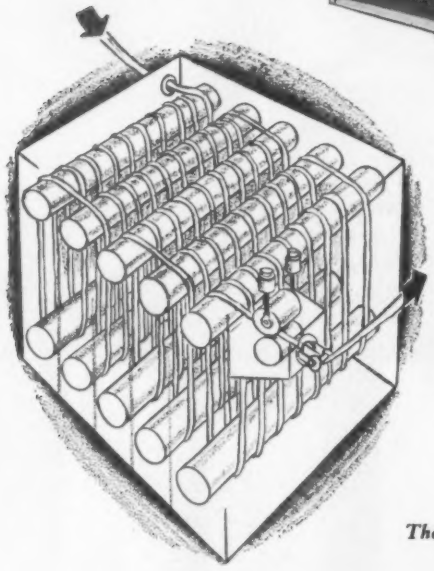
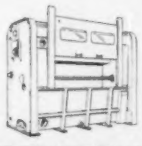
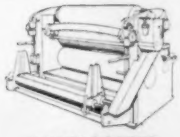


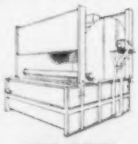
This totally-enclosed, high-speed multi-stage washer, of all stainless steel construction, will soap, wash, or treat a wide range of fabrics of various weights. It is compartmented to combine chemical or hot and cold processes. Auxiliary squeezers are designed to mount over any compartment. Great savings in water are possible because the washer is compartmented for positive counterflow. All compartments are free-draining and easily cleaned for quick changes from colored to white goods. The Wiesner-Rapp Multi-Stage Washer, which is shipped assembled, normally is mounted directly on the floor, with no pit required, and therefore little time is needed to put it in operation. It is easily threaded and can be used in harmony with other machines of a range or as an individual unit. Designed and built to Wiesner-Rapp high standards; requires minimum maintenance.

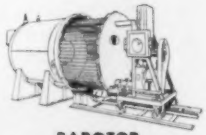
The Wiesner-Rapp technical staff will be glad to discuss Multi-Stage features with your personnel.

OTHER WIESNER-RAPP MACHINES


TIGHT-STRAND WASHER


3-ROLL PADDER


DYE BECK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THE WIESNER-RAPP CO., INC.

1611 SENECA ST., BUFFALO 10, N. Y.

Manufacturers of Wet-Finishing and Dyeing Machinery

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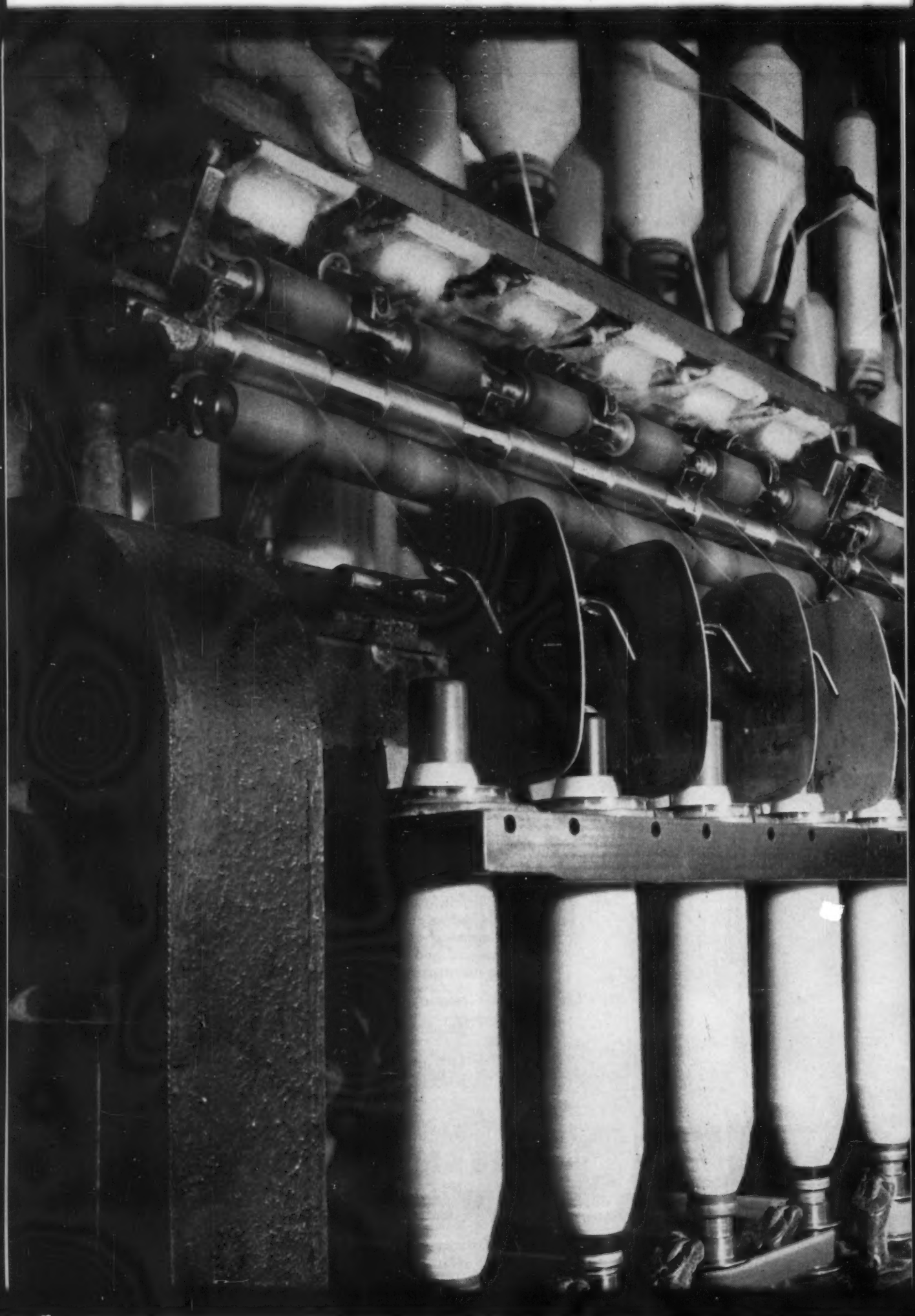
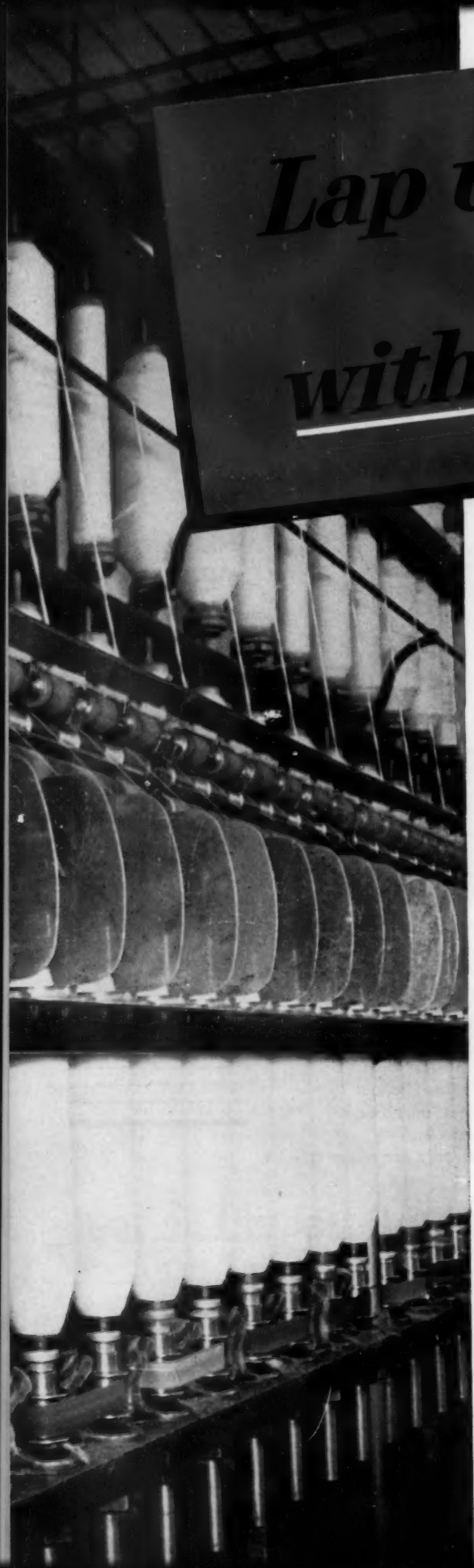




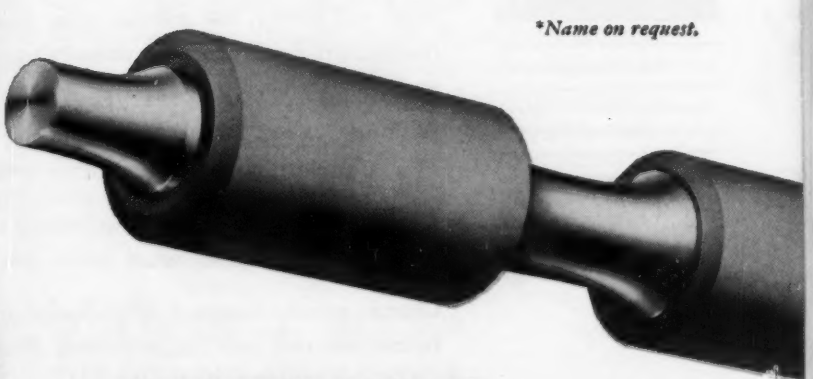
Lap ups reduced 4 to 1 with Dayco Cots

That's the record for one southern mill* after extensive tests of Dayco Cots. Regardless of weather—hot, cold, muggy or rainy—high humidity or low, Dayco Cots minimized lapping 4 to 1 over other cots.

Even in "dog days", when control of humidity was next to impossible, Dayco Cots stayed dry, never becoming gummy or sticky. Principal reason is the exclusive Dayco construction. Made of finest synthetic rubber compounds, Daycos have no large rough fillers that cause excessive lap ups and ends down or ingredients that become soft or sticky on highly humid days. Daycos are saving a lot of downtime for mills everywhere.

Why don't you make a money-saving test? Write Dayton Rubber Company, Textile Div., 401 South Carolina National Bank Building, Greenville, S. C.

*Name on request.



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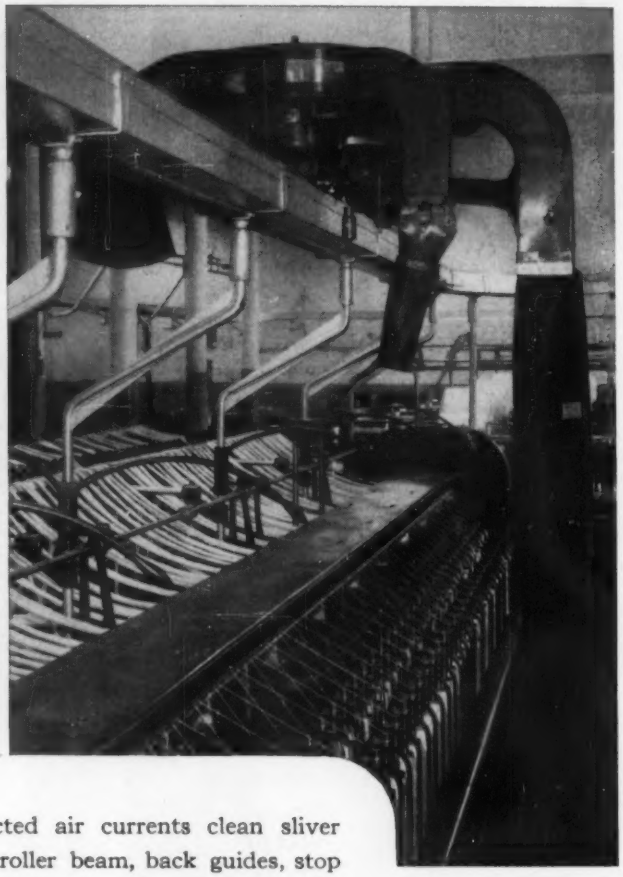

Controlled, individually directed air currents clean sliver creel, roll covers, roll stands, roller beam, back guides, stop mechanism, flyers including presser fingers, traversing carriage and underframe.

Room Cleaner may be attached to Frame Cleaner for cleaning ceiling and other overhead surfaces.

401

During doffing and creeling periods air currents are automatically reduced or deflected.

Cleaner greatly lessens flyer chokeups and other lint troubles. Operatives can tend more frames. Production is increased. Quality of roving is improved.

Parks-Cramer Company

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Traveling Cleaner Systems Since 1926

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Any way you look at it—sheet for sheet, pound for pound or bag for bag—VISQUEEN now is not only the *best* packaging film you can buy. It is also the cheapest. You actually pay less money to get all the advantages VISQUEEN film gives you.

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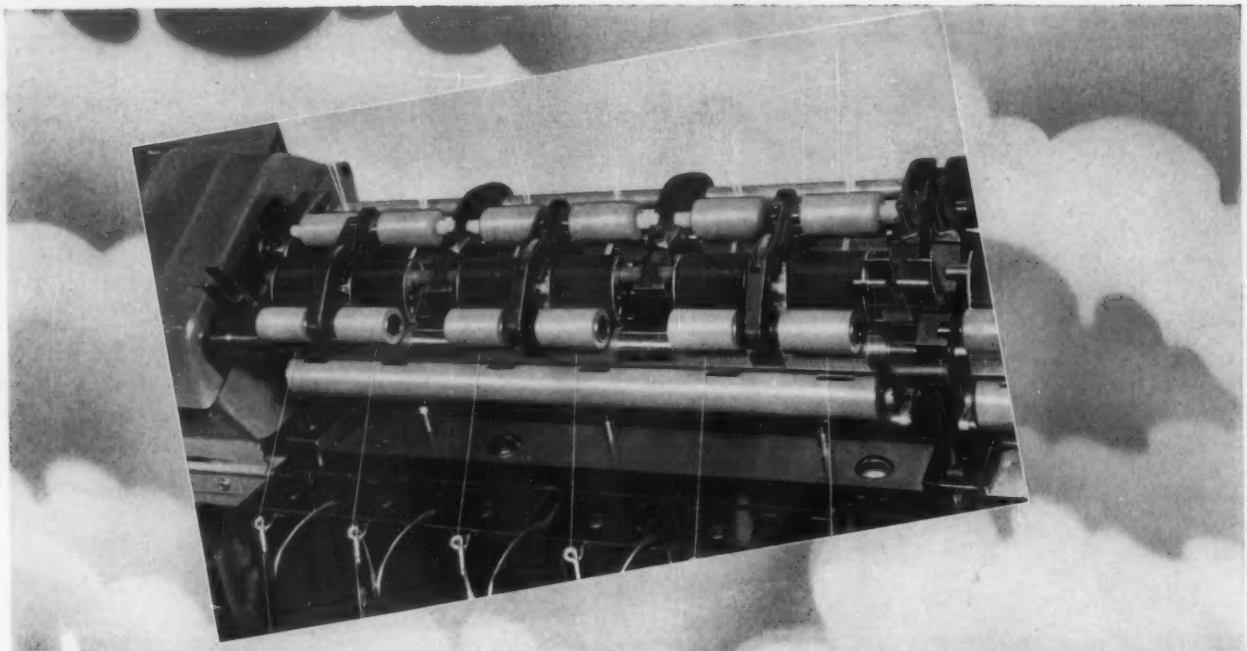

1,250,000 SPINDLES OF SACO-LOWELL DUO-ROTH —BOTH STANDARD AND STAY-CLEAN*— *are now in operation producing higher quality, stronger, more even yarn in over 280 mills.*

1. The long, thin, flexible bottom apron passes the nose of the apron bar with a small radius of curvature in a manner which allows a close setting between the nip of the aprons and nip of the front roll, a condition necessary for the most efficient fibre control in the final drafting zone.

2. Without exception, mills using the Duo-Roth System have increased their drafts as much as 50 to 100 per cent, and at the same time have produced a yarn of greater strength and evenness.

3. The greater strength and evenness is vividly shown in a Duo-Roth installation producing 21's yarn from .75 hank single roving, employing a 4.52 twist multiple — the break factor secured is 2339. Previously, the same frames running regular drafting were producing 21's yarn from 1.50 hank single. With same twist multiple highest break factor obtainable was 2104.

4. Duo-Roth is cleaner; there is a reduction in clearer waste as the shorter fibres are efficiently controlled. After raising the draft from 19 on Roth to 33 on the Duo-Roth, one mill was able to extend the top roll cleaning period from 24 hours to 48 hours, on a three-shift basis. Another mill, with a 50 per cent increase in draft after changing to Duo-Roth, also extended the top roll cleaning period from 24 hours to 48 hours.

5. Duo-Roth was engineered to be a simple, quickly applied change-over to existing Roth installations. Mills having Roth frames in good condition will find that Duo-Roth will pay for itself in savings resulting from increased draft, reduced cleaning, improved operating conditions and smoother, stronger yarns.

6. Duo-Roth is the only double-apron drafting system which does not develop wear of the cage against the apron driving roll. The standard Duo-Roth middle top roll, driving the apron, is built with a stationary arbor. The cage rests against the stationary arbor, eliminating the possibility of cage wear — a common problem with other systems.

7. The knurled and polished surface of the Saco-Lowell Duo-Roth middle top roll creates a positive and uniform drive for the aprons. Since both of the driving bosses are tied together, there is no variation in the speed of the top roll aprons regardless of the bulk of the strand being drafted. There is no slip or hesitation to create unfavorable conditions in the principal drafting zone.

8. The Duo-Roth, with the adjustable cage is extremely flexible. The correct pressure to establish the necessary degree of fibre control for the most efficient drafting can be quickly attained through easy adjustments.

A BROCHURE FULLY DESCRIBING SACO-LOWELL DUO-ROTH IS AVAILABLE ON REQUEST. SACO-LOWELL ENGINEERS WILL ALSO BE GLAD TO ARRANGE A DEMONSTRATION.

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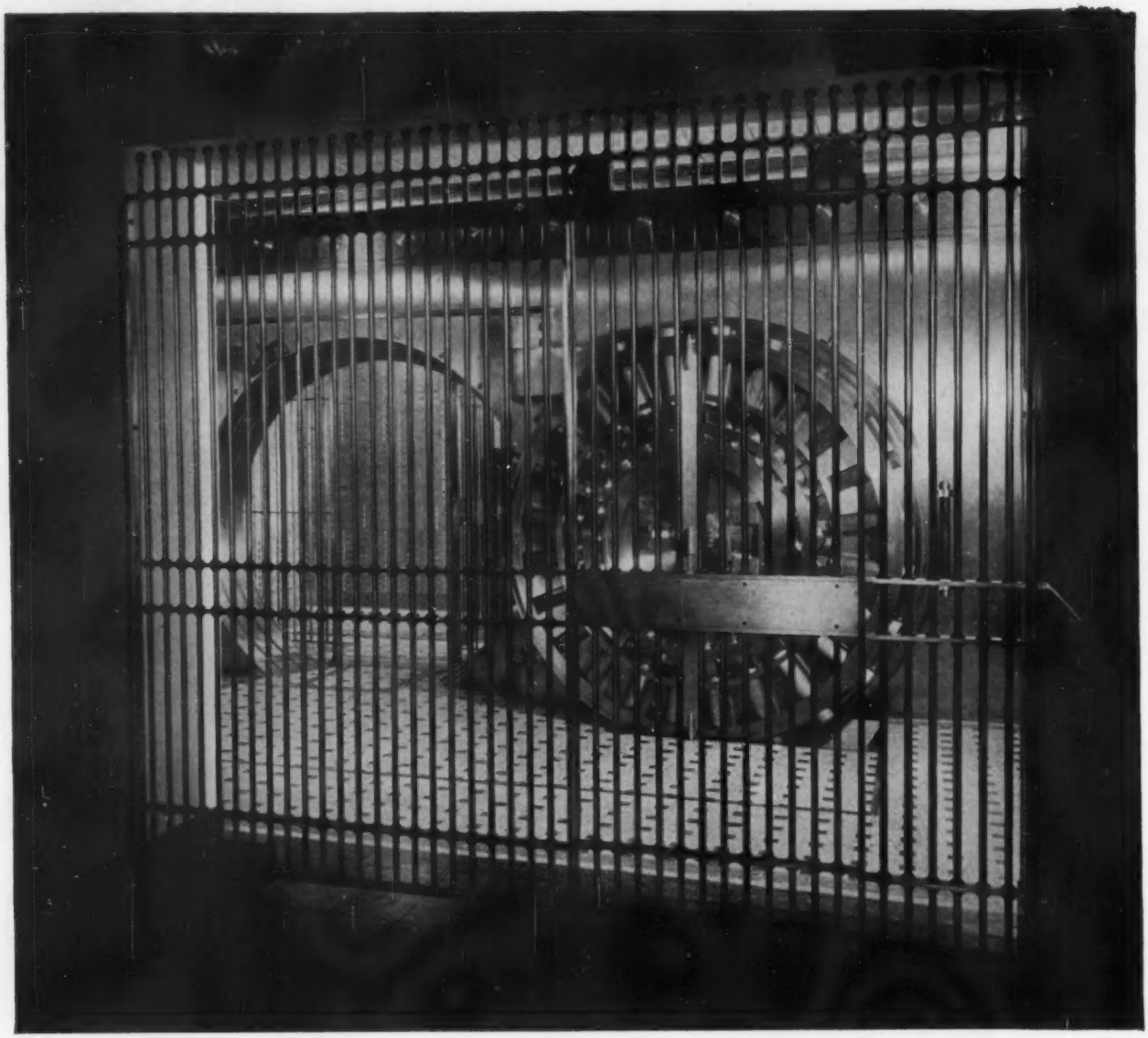

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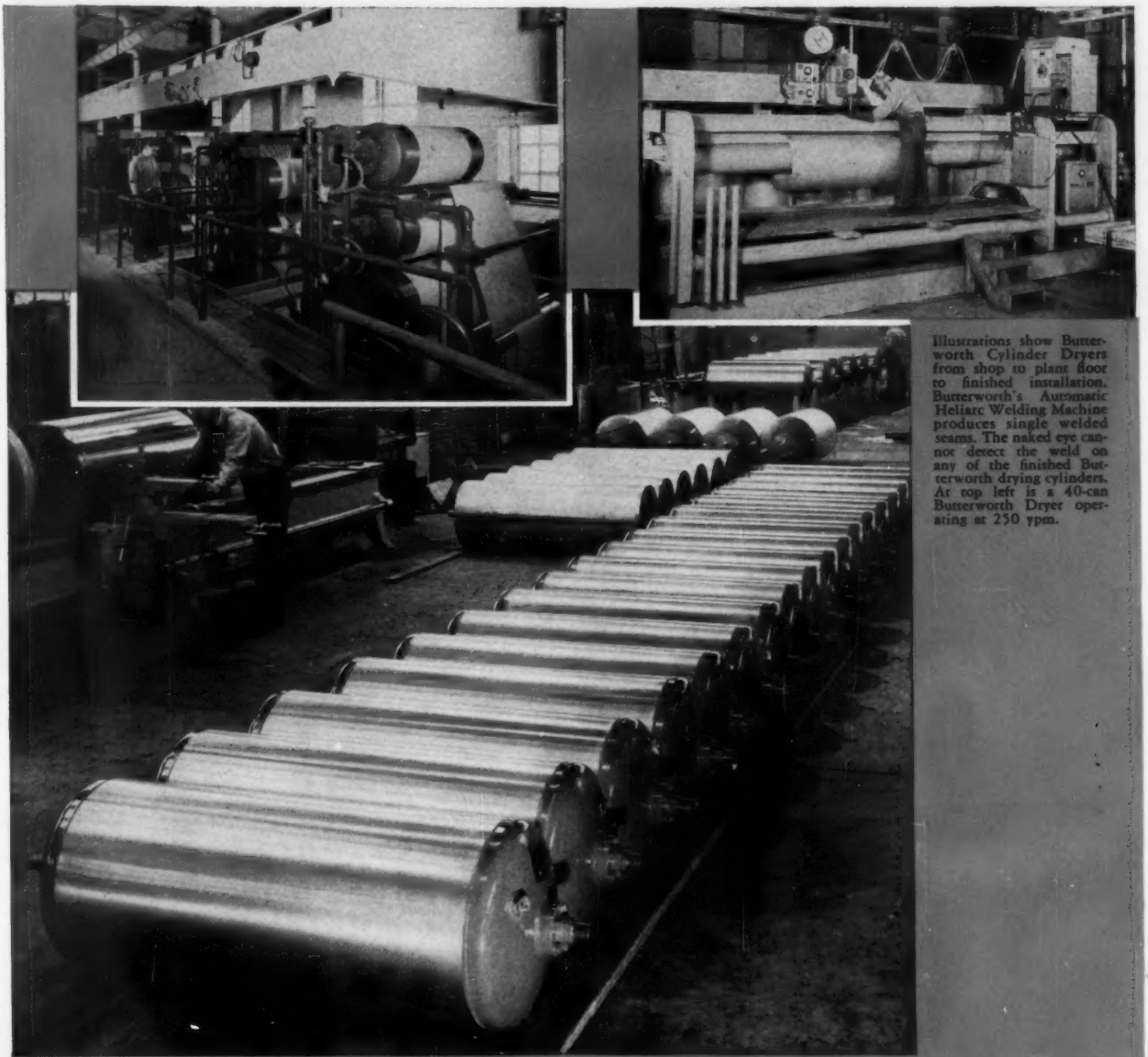

Illustrations show Butterworth Cylinder Dryers from shop to plant floor to finished installation. Butterworth's Automatic Heliarc Welding Machine produces single welded seams. The naked eye cannot detect the weld on any of the finished Butterworth drying cylinders. At top left is a 40-can Butterworth Dryer operating at 250 ypm.

Smoother Cylinders . . . Better Dryers

Here's seam-welding so precise you can't see the seam on the finished cylinder.

A switch is snapped and a cylinder is welded in one slow, steady, precise movement. With this automatic welding machine, error hasn't got a chance.

It takes superior equipment to produce superior products — this is a manufacturing philosophy that Butterworth puts into practice. It's why Butterworth cylinders are smoother and stronger than ever before. And it's why Butterworth can give you fine machinery at a competitive price.

Butterworth drying equipment is engineered to meet your specific requirements, such as weight of cloth, width of cylinder, moisture content and dryness desired. You can specify coded or uncoded, copper or stainless steel cylinders; vertical or horizontal arrangement; fabricated or cast-iron columns; gear, sprocket-and-chain or V-belt drive. Whether your problem calls for cylinders, a complete machine — or a special finishing range that requires complete cooperation between machine-builder and your own engineering staff — talk to a Butterworth man. Write us today.

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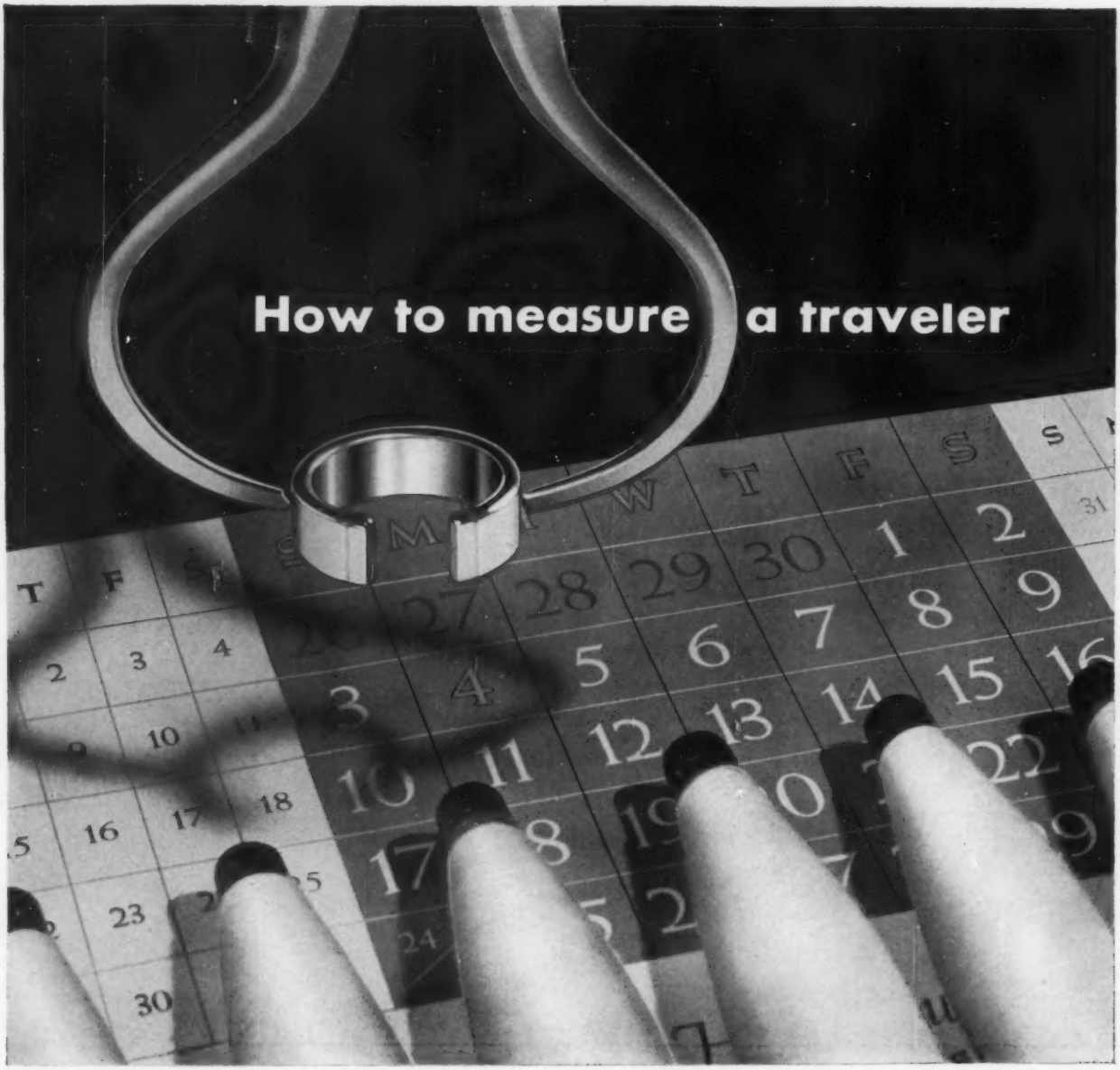

Measure a traveler by days of trouble-free service, and by pounds of first-quality yarn delivered. Travelers vary widely by this test, even though they *look* alike and meet dimensional specifications.

Under *any* conditions, you can be sure of maximum production per traveler when you rely on Victor experience and quality control.

That's the reason why Victor Travelers are chosen for over 12,000,000 spindles. Mill men everywhere find that Victor quality pays off, consistently, in longer traveler life . . . with fewer ends down . . . at higher spinning and twisting speeds.

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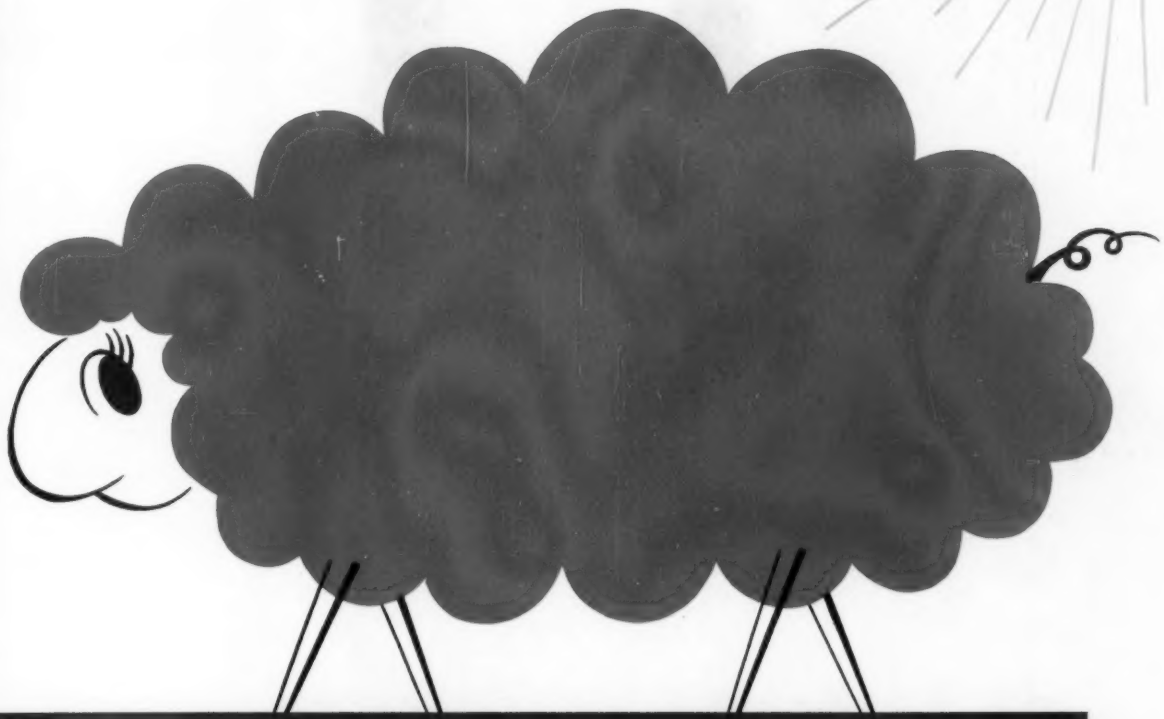
that are "safe in the Sun"



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In all strengths National Chromolan Red GRE has many desirable properties that commend its use on wool and as a union dye on nylon-wool mixtures. This low pH pre-metallized color produces moderately bright shades of yellowish red with very good to excellent fastness to light, washing, perspiration, carbonizing and cold water bleeding.

A good money value, National Chromolan Red GRE deserves a place in your wool and wool-mixture dye formulations. A working sample will demonstrate its worth. Our Bulletin 421 gives complete properties. Both are yours-for-the-asking from our nearest office.

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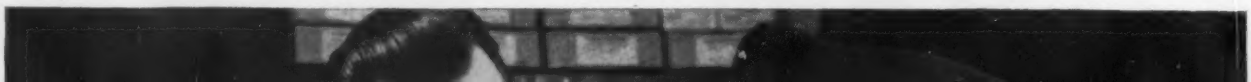

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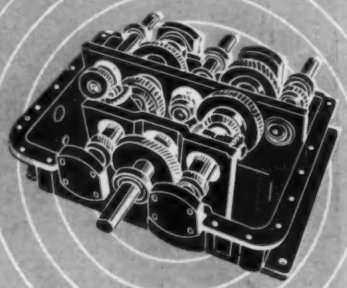

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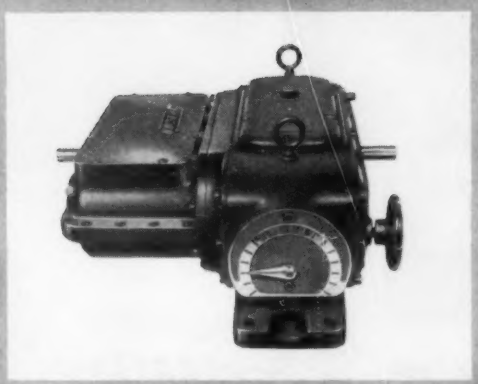

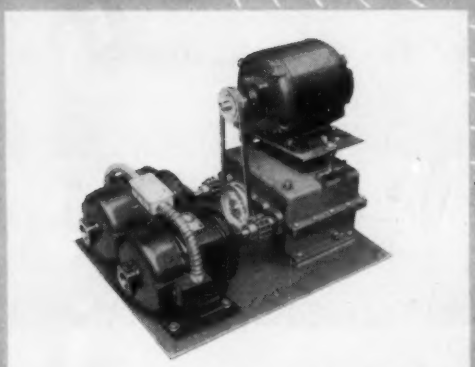

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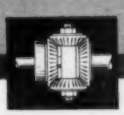

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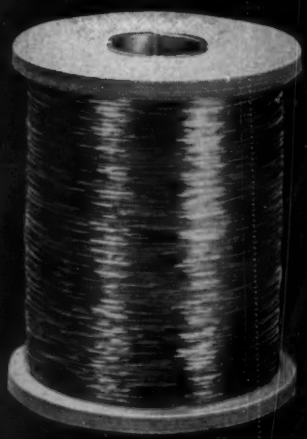

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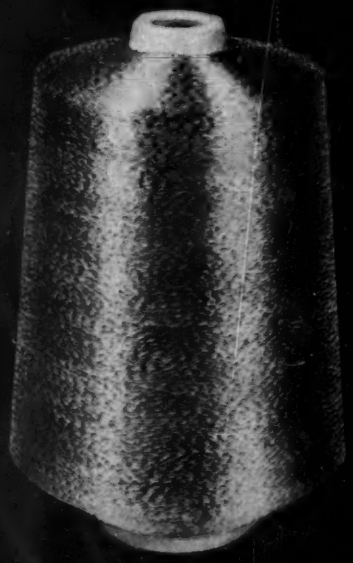

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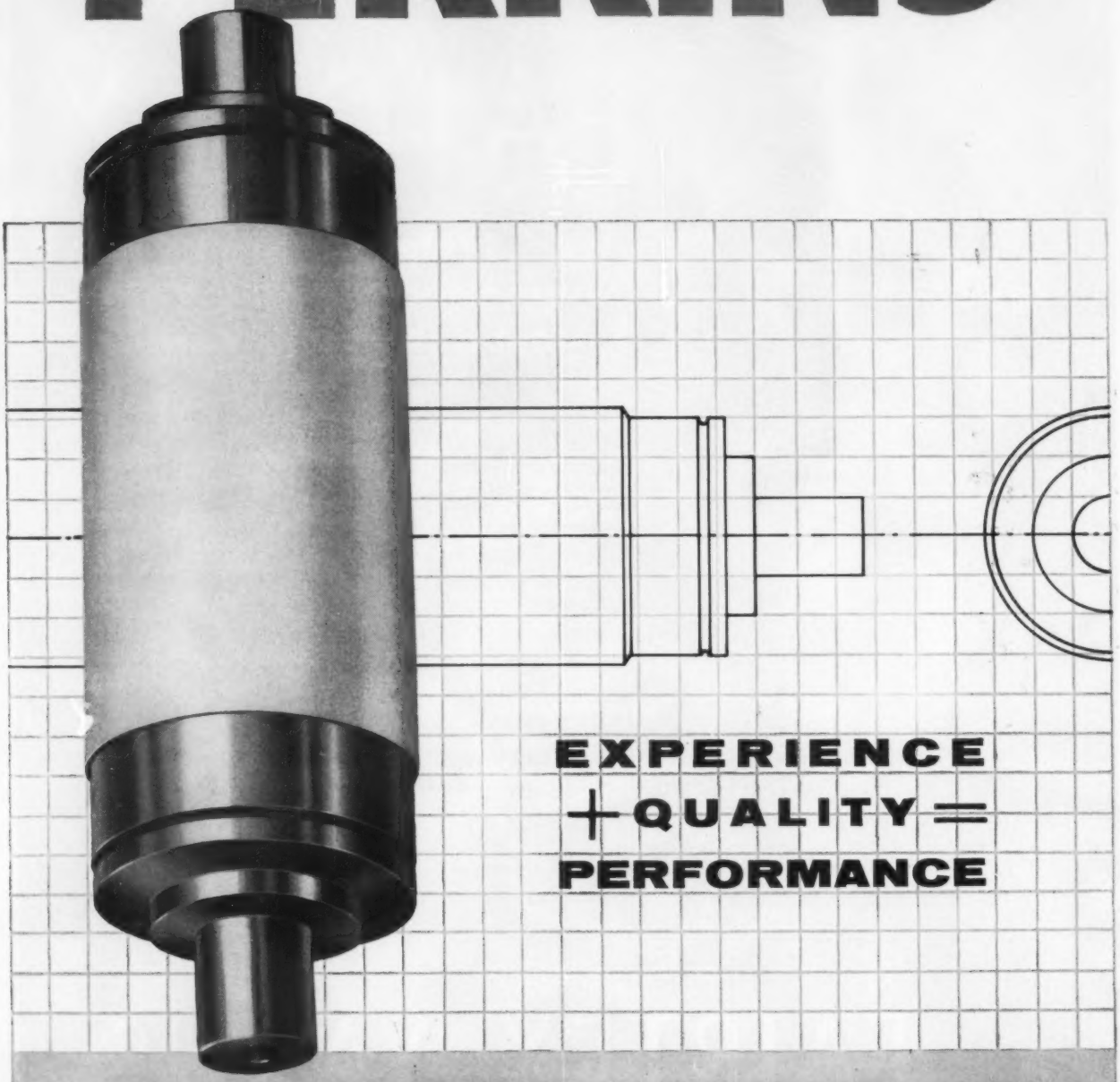

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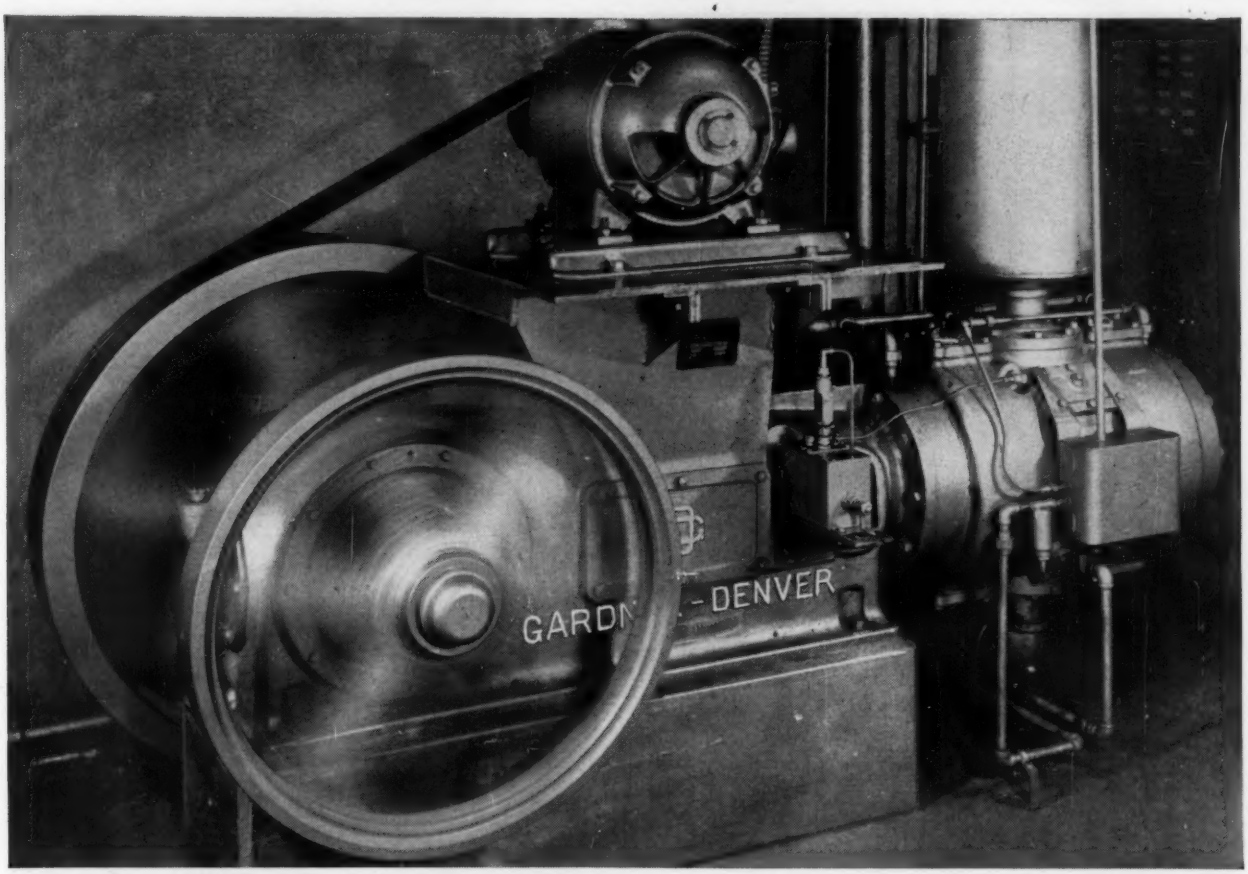

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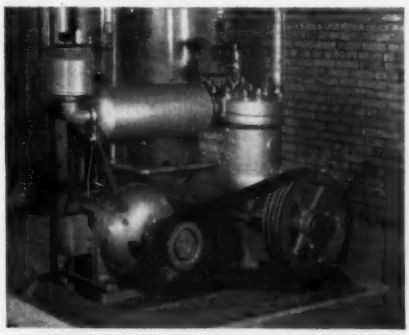

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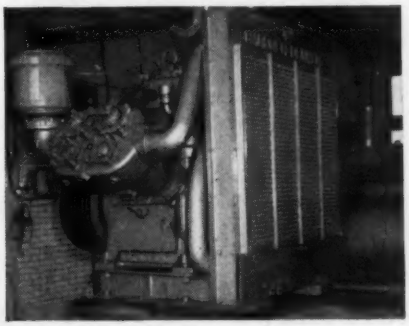

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THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

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61,167 gauges...to deliver your Crane Valves 100% quality inspected

Care-how! A newly coined catch-phrase? Not at Crane! It is a rigidly-adhered-to principle of quality control—100 years old!

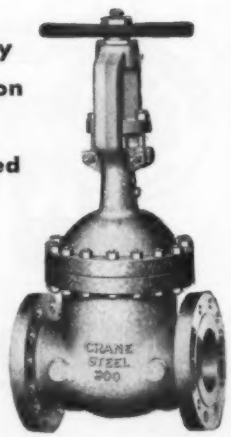
By way of example, the Crane technician in the photograph is checking the taper, size and guide slot alignment on gate valve discs. Every disc must correspond to the setting of the indicators—to tolerances of .001 inch plus or minus, on the taper, and .008 inch on the alignment of the slot guides. And Crane uses 61,167 gauges to insure dimensional accuracy.

Why this Care-how? To assure you of smoother, longer lasting valve operation, with lower maintenance and repair costs.

There you have the reasons why knowing and thrifty buyers prefer Crane valves . . . why industry uses more Crane valves than any other make! And the reasons why you should always buy Crane. Crane Co., General Offices, 836 S. Michigan Ave., Chicago 5, Illinois. Branches and Wholesalers serving all industrial areas.

Better Quality
Bigger Selection
in Valves
for Every Need

for the THRIFTY BUYER



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KITCHENS • PLUMBING • HEATING

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- ○ Send me all the facts on new low-cost Askania Edge Position Control Model 500.
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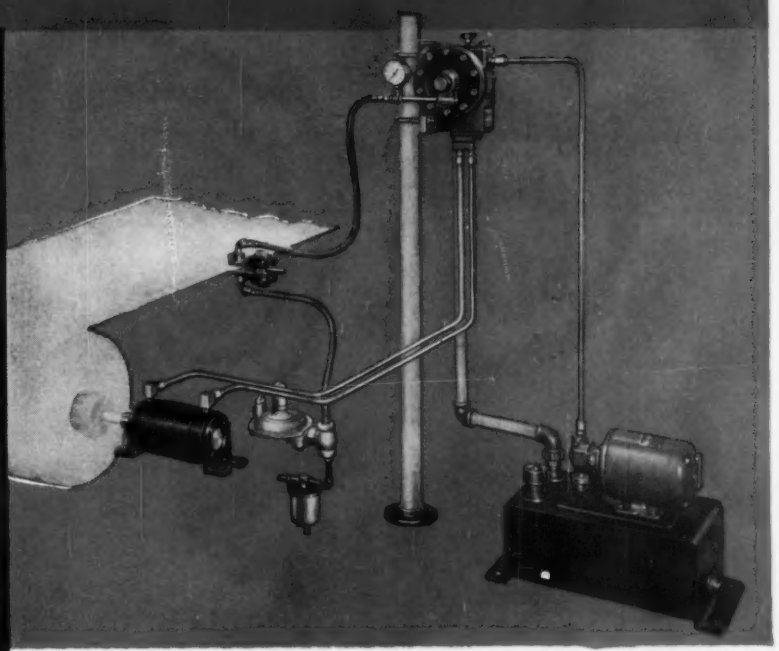
ASKANIA Model 500

A light-duty web guide at a new low price

NEW



Think of it! A real Askania web guide – with all the simplicity and performance that have made Askania the world's largest seller – now engineered for light-duty work and yours at a new low price.

We've designed the new Model 500 especially for tubers, printers, examining machines, and other cloth-handling equipment. Model 500 is tailor-made for most of the machines in your mill.

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Model 500 is a complete package, ready to install. Compact, efficient hydraulic power unit; exclusive Askania Jet Pipe regulator, the same kind of control that heavy industry relies on for the most exacting jobs; Askania sensing nozzle for precise edge position measurement without touching the web; steel hydraulic cylinder; pipe stand floor flange; tubing, air hoses, and fittings. All you have to supply is a few short lengths of pipe.

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For more information, write direct or use Reader-Service post card.

AIM* for the best in production line packaging with new Acme Steel Strapping Machines

Acme Idea Man J. H. Scott Birmingham, Ala. helped Pepperell with this packaging idea

ask your *Acme Idea Man to help solve your problems

Pepperell Manufacturing Company, one of the country's leading textile manufacturers, is enjoying new production efficiencies and economies with this new Acme Steel F3 Automatic Strapper. (Idea No. 438.) *One* operation applies three straps simultaneously with the proper degree of compression, weighs and directs the flow of cartons on a motorized conveyor. Packages are uniform in appearance, straps are placed accurately, and because of uniform compression, they are easier to tier for warehousing. Contents of cartons are safe and secure . . . pilferage and shipping damage are minimized.

This is the type of progressive engineering and forward thinking your Acme Idea Man can offer you. Why not consult with him—let him analyze your present packaging and shipping methods? Call him at the nearest Acme Steel office, or write Acme Steel Products Division, Acme Steel Company, Dept. EE-125, 2840 Archer Avenue, Chicago 8, Illinois.

AIM *For Safe, Lower-Cost Shipping*

ACME STEEL

MILL TESTED AND PROVED

THE FIRST LINT-PROOF TEXTILE MOTOR

- ELIMINATES MOTOR CLEANING COSTS
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- TOTALLY-ENCLOSED—PREVENTS WATER DAMAGE
- REDUCES FIRE HAZARD
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Now available—1-20 hp. general-purpose, totally-enclosed, air-cooled, textile motor for application on spinning, roving (low torque), drawing and twisting frames, and on cards, openers, pickers and other textile machines. B-1504

RELIANCE Totally-Protected MOTORS

RELIANCE ELECTRIC AND ENGINEERING CO.

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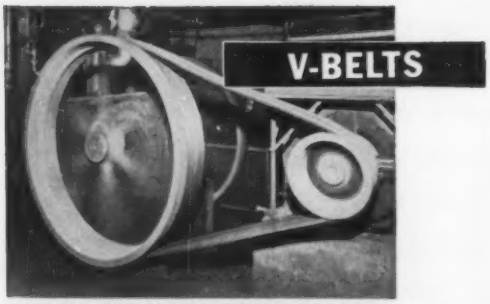
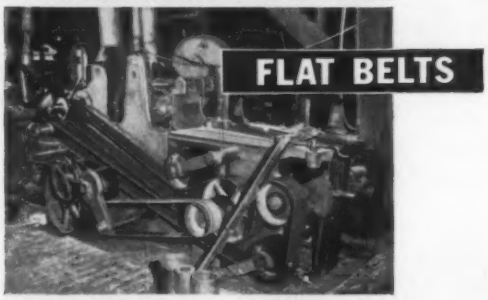
A complete line of

Flat Belts, V-Belts and Sheaves and "TIMING"® Belts and Pulleys

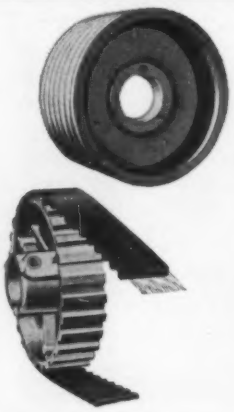




● Whatever your power transmission requirements, "U. S." can supply them. With "U. S." distributors and warehouses strategically located across the country, you are assured of immediate *service* and shipment.

U. S. Rubber power transmission technicians are always ready to help you. Get in touch with one of our selected distributors or any of our 27 District Sales Offices or write to address below.

MULTIPLE V-BELTS • F.H.P. V-BELTS
SHEAVES • FLAT BELTS AND BELTING
SPECIAL PURPOSE BELTS
PowerGrip "TIMING" BELTS AND PULLEYS



V-Belt Sheaves and "TIMING" Belt Pulleys

are tested for static balance and engineered to deliver the high durability and efficiency that are built into every "U. S." Belt.

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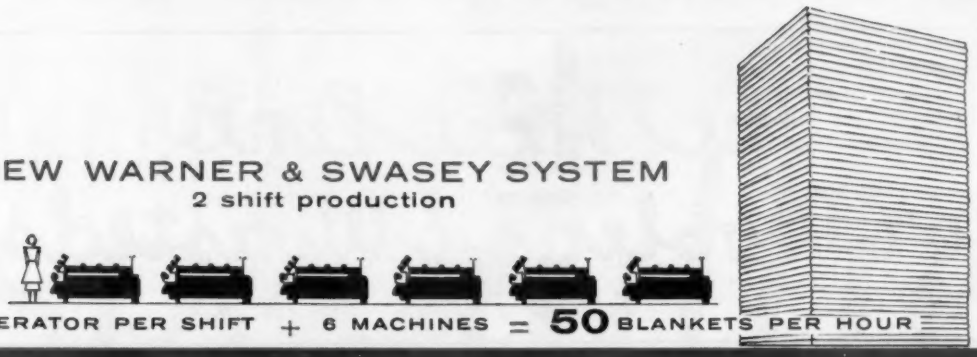
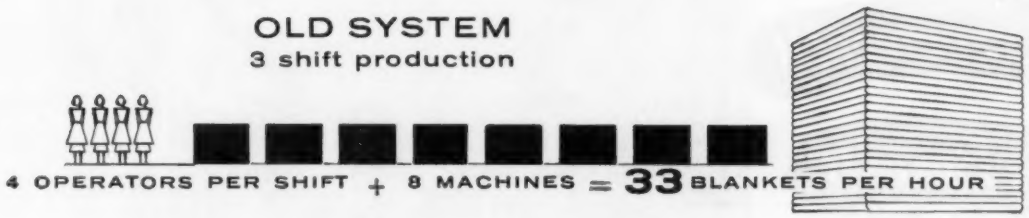


WARNER & SWASEY-SULZER WEAVING MACHINES®
PILE UP BLANKET PROFITS *For Litchfield Woolen Mills*

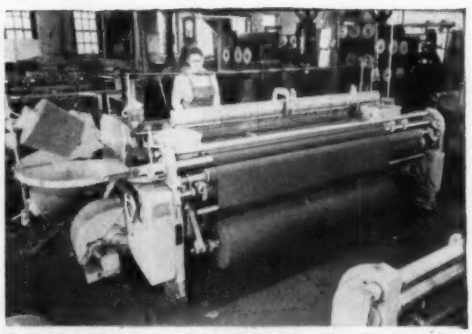


PROFITABLE PRODUCTION of inexpensive woolen blankets, like those made by The Litchfield Woolen Company, requires keeping a sharp eye on costs, and use of the most modern, efficient equipment available. That's why this small mill installed 6 new Warner & Swasey-Sulzer Weaving Machines.

These 6 machines, operating just two shifts, match the production that previously required 8 looms operating 3 shifts. And all 6 machines require only one operator each shift where 4 weavers per shift were previously needed—cutting labor costs 83%! Quality of blankets has been improved in appearance and feel, and "seconds" have been reduced 50%! The machines' big package-type filling supply has cut waste to the bone—bobbin bunches are completely eliminated by their direct-drawing shuttles—with savings on waste equivalent to 6,000 blankets per year! Operators quickly mastered the new machines and much prefer their simple operation. At present production rates the machines will pay for themselves in 4 years!

Modernization with Warner & Swasey-Sulzer Weaving Machines will boost production while cutting costs for you, too. Call in our Field Engineer and get the full details.

®Reg. U. S. Pat. Off.



One of six Warner & Swasey-Sulzer Weaving Machines cutting weaving costs at The Litchfield Woolen Mills Company, Litchfield, Minnesota.

75TH ANNIVERSARY YEAR
WARNER & SWASEY
Cleveland
PRECISION MACHINERY
1880 — 1955
TEXTILE MACHINERY DIVISION

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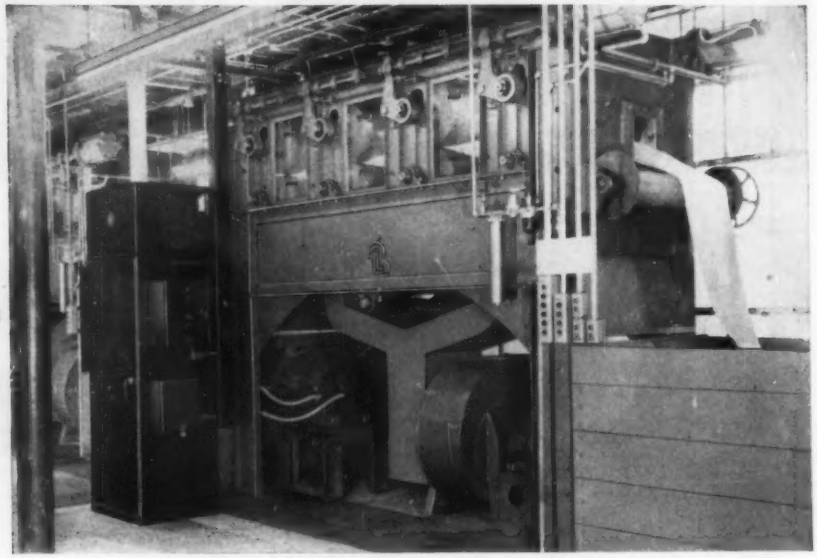
The Fleet Line for Woolens & Worsteds

CONTINUOUS CRUSHER

It's Modern!

It's Economical!!

It's Best!!!



Model CCT-4 (shown here) is dual-unit continuous crusher of 2 units in tandem

CHECK THESE FEATURES

- ✔ 1. Space-Saving, Labor-Saving
- ✔ 2. Accurate Dust Control and Exhaust
- ✔ 3. Crushes Better than Batch Process
- ✔ 4. Easy Operation, Uniform Pressure
- ✔ 5. Removable See-Through Panels
- ✔ 6. Practically No Vibration
- ✔ 7. Coiled Spring Pressure, under Pneumatic Cylinder Control
- ✔ 8. Adjusts for Desired Delivery Speed
- ✔ 9. Synchronizes with Carbonizing Range
- ✔ 10. Consorts with Any Carbonizing Range

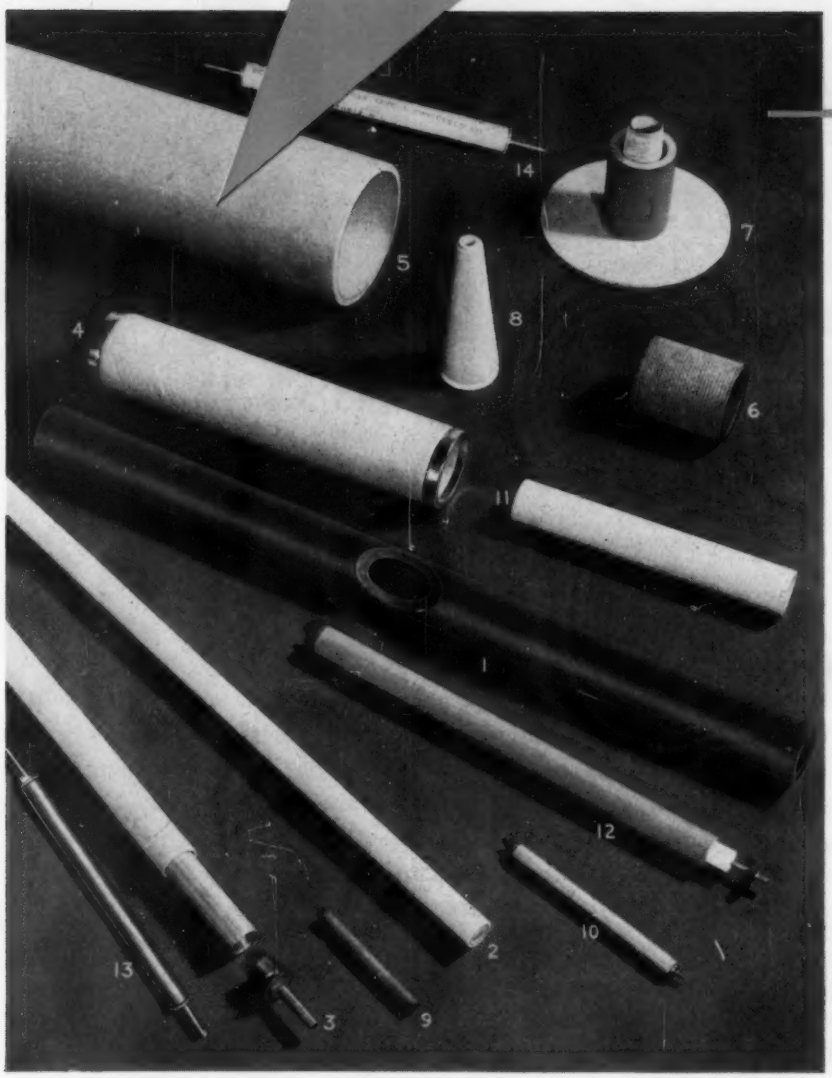
NOTE: This completely redesigned and modernized Continuous Crusher makes possible one single continuous operation of acid soaking, drying, baking and crushing. Continuous neutralizing machine is also available to run in tandem with it if desired.

RIGGS AND LOMBARD INC.

FOOT OF SUFFOLK STREET, LOWELL, MASS.

Agents: Paul A. Merriam Company, P. O. Box 86, Providence, R. I., Albert R. Breen, 80 E. Jackson Blvd., Chicago 4, Ill., Larry T. Nelson, 2824 S.W. Montgomery Drive, Portland, Ore., F. W. Warrington Co., 611 Johnston Bldg., Charlotte, N. C., A. Harold Zayotti, Jr., P. O. Box 125, Riverton, N. J., H. E. Mott Co., Limited, Brantford, Ontario, Canada.

SONOCO PAPER *specialties*



FOR THE TEXTILE INDUSTRY

If it's a problem in textiles that paper can solve, you can depend on SONOCO for exhaustive research and product development.

For over 50 years, SONOCO textile specialty products have kept pace with the ever-changing textile industry by providing greater efficiency, greater speed or reducing man hours and cost of operation.

Consult your SONOCO sales-engineer or write us direct on your particular problem.

PICTURED ABOVE—(1) tie-in tubes; (2) card clearer roll covers; (3) topping (Thompson) rolls and covers; (4) pin drafter cores; (5) loom beam repair tubes; (6) spooler cheese cores; (7) rayon cake forms; (8) cork covered cones; (9) temple roll cores; (10) self-weighted or floating roll covers; (11) roving tubes; (12) underclearer rolls; (13) aluminum ball warp mandrels; (14) ball warp tubes.

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For more information, write direct or use Reader-Service post card.

Gulftex Oil is applied to the needles of the full-fashioned hosiery knit-

with a see-thru package by Shellmar-Betner

Any textile product looks its Sunday best in a Shellmar-Betner see-thru* package. It's never shopworn, even after repeated handling by customers. And both retailers and shoppers appreciate this packaging for its fresh, crisp, colorful look.

This pajama package is only one example of hundreds of different packages that Shellmar-Betner craftsmen make especially for the textile industry. If you're interested in better flexible packaging for your product, call Shellmar-Betner today.

*Remember!
we convert
Shellene (Polyethylene), Cellophane, Saran, Acetate, Pliofilm, Mylar, Vinyl. Laminations — combining all types of Flexible Packaging Materials. Shell-Pli — Shell-Glo

Our Fiftieth Year of Tailor-Made Packaging

CONTINENTAL CAN COMPANY

SHELLMAR-BETNER
Flexible Packaging Division
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Gulftex Oil is applied to the needles of the full-fashioned hosiery knitting machines at the Virginia Maid Mill with a plastic squeeze bottle.

"We reduced needle breakage with GULFTEX OIL"

says Mr. Earl S. Gress, Superintendent,
Virginia Maid Hosiery Mill, Inc., Pulaski, Va.

"During the two years we have been using Gulftex Oil in our knitting machines we have noticed that needle breakage is down considerably, and needles stay clean—free from gum deposits and rust," says Mr. Gress. "Needless to say, we have increased output and reduced maintenance costs."

In addition to the many fine qualities that Mr. Gress has found to be so important, Gulftex Oil has superior non-staining characteristics which make it a valuable lubricant for any application where the staining of fabrics is a problem.

So if you feel that your needle lubricant is not doing the best possible job, call in a Gulf Sales Engineer and have him demonstrate the advantages of Gulftex Oil in your mill. You can contact him today at your nearest Gulf office.

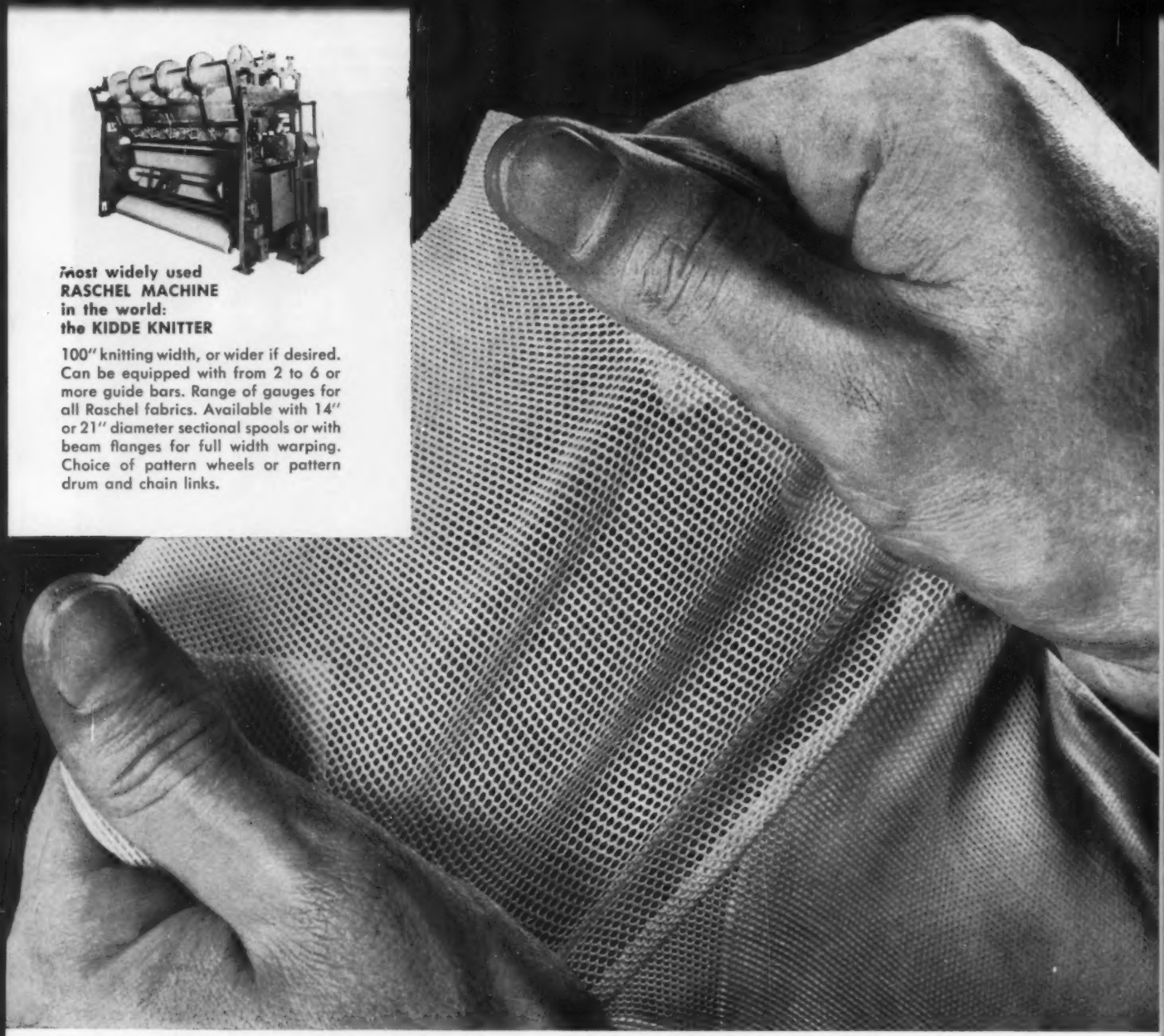
Gulf Oil Corporation · Gulf Refining Company
1822 Gulf Building, Pittsburgh 30, Pa.

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

Most widely used RASCHEL MACHINE in the world: the KIDDE KNITTER

100" knitting width, or wider if desired. Can be equipped with from 2 to 6 or more guide bars. Range of gauges for all Raschel fabrics. Available with 14" or 21" diameter sectional spools or with beam flanges for full width warping. Choice of pattern wheels or pattern drum and chain links.



How fast should you run a Raschel machine on 4-bar elastic fabric?

Experienced knitting department supervisors know that *you cannot measure a Raschel machine's output by the minute.* Instead, the wise knitter thinks in terms of pounds of first-quality fabric produced per shift, per week, or per month.

This kind of intelligent evaluation of production rates has made the KIDDE Knitter the world's most widely used Raschel type warp knitting machine. For the KIDDE Knitter backs up high "per minute" speeds with reliability that maintains these speeds over long periods with next-to-no down time for repairs . . . keeps defects well below the acceptable limit for first-grade fabric. It's a versatile machine, too. No matter what kind of Raschel-knit fabric you produce, you'll find that the Model E KIDDE Knitter will do the job. For complete information, write us today.

Kidde

TRICOT AND RASCHEL MACHINES • TRICOT WARPERS • HORIZONTAL WARPERS BEAMERS • CREELS • SLASHERS • WINDER-REDRAWS • TENSOMETERS

MANUFACTURING CO., INC. — 42 FARRAND STREET — BLOOMFIELD, NEW JERSEY

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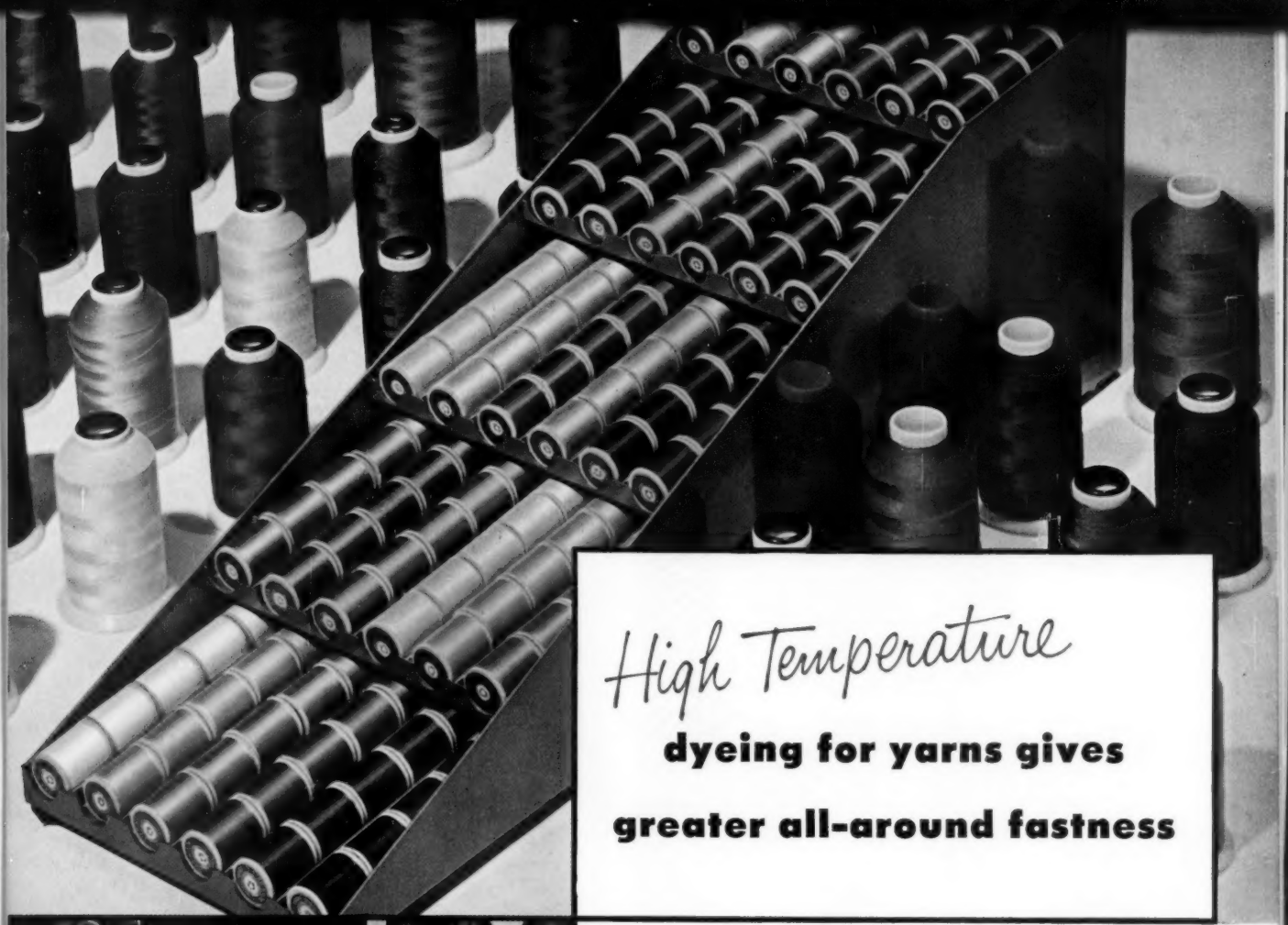
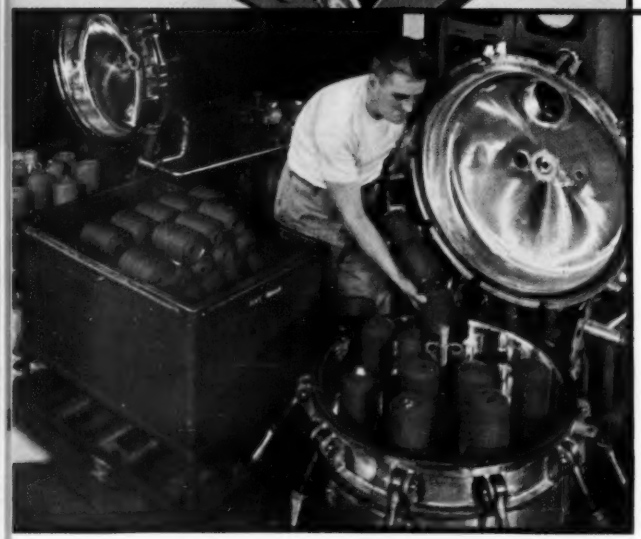


High Temperature

dyeing for yarns gives greater all-around fastness



Stock and piece dyeing of the newer hydrophobic fibers at 250°F. was developed successfully by Du Pont research working with a number of dyers. Now — a similar method for dyeing yarns of synthetic fibers has proved its value.

High-temperature dyeing has overcome fastness problems for many different types of yarn. The installation shown at left is operated at the American Thread Company. Increased rate of diffusion of dye into the fiber cuts dyeing time considerably, gives better fastness.

Developed and used so far only for synthetics, Du Pont is continuing research on applications of this method to other fibers. If you would like more complete information on high-temperature dyeing, contact your Du Pont representative or write to E. I. du Pont de Nemours & Co. (Inc.), Dyes and Chemicals Division, Wilmington, 98, Delaware. In Canada — Du Pont Company of Canada Limited, Montreal, P. Q.

Improved results with high-temperature yarn dyeing:

for **NYLON**—color is uniform through each layer of the package. Further, when chrome colors are used, chroming time and quantity of sodium dichromate are both cut, yet still give complete chromation and highest wet fastness.

for **"DACRON"***—need for a chemical carrier is eliminated, which cuts costs. Color buildup is excellent, giving deep, bright colors with no spotting or streaking, no loss of light fastness.

for **"ORLON"****—a complete range of shades is now possible for the first time. High-temperature dyeing is the only method that gets dye completely into filament "Orlon."

*Du Pont trademark for its polyester fiber **Du Pont trademark for its acrylic fiber

Du Pont Dyes

DU PONT

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Aérodynamique-Thermodynamique

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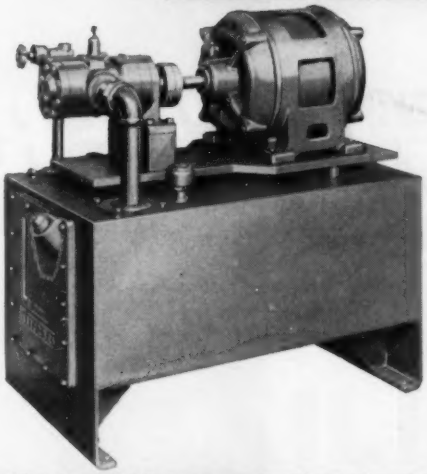
BETTER products FASTER

When Your Textile Machinery has

VICKERS Hydraulic Power Units

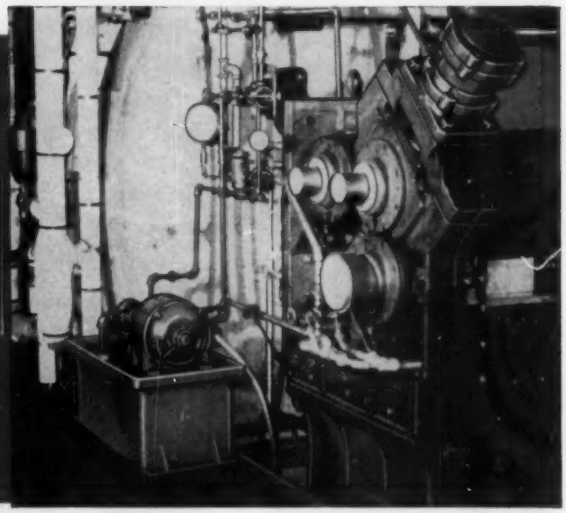


Dependable and practically maintenance-free, Vickers Hydraulic Power Units are a compact self-contained power source for hydraulic systems on a wide variety of textile machinery. They frequently simplify design and save installation costs. Many are standard stock units while others are individually designed for the machines they serve.

Vickers Hydraulics has numerous additional advantages for the user and the builder of textile machinery. Note applications below and then ask our nearest Application Engineering Office for a copy of Textile Bulletin 54-66.

WARPING UNIT

Delivers larger warps of uniform density. Stepless control of beam against press roll prevents scuffing. Vickers Hydraulic System is completely adjustable to meet all conditions. Accommodates beam heads up to 40" diameter.



HIGH TEMPERATURE CONTINUOUS DYEING MACHINE

Provides faster continuous dyeing by dye bath at temperature above atmospheric boiling point in pressure vessel. Cloth passes in and out between rolls that form pressure seal. Nip pressure between rolls is provided and held uniform by Vickers Hydraulics.

FOR FURTHER INFORMATION *Ask For* BULLETIN 54-66

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7248

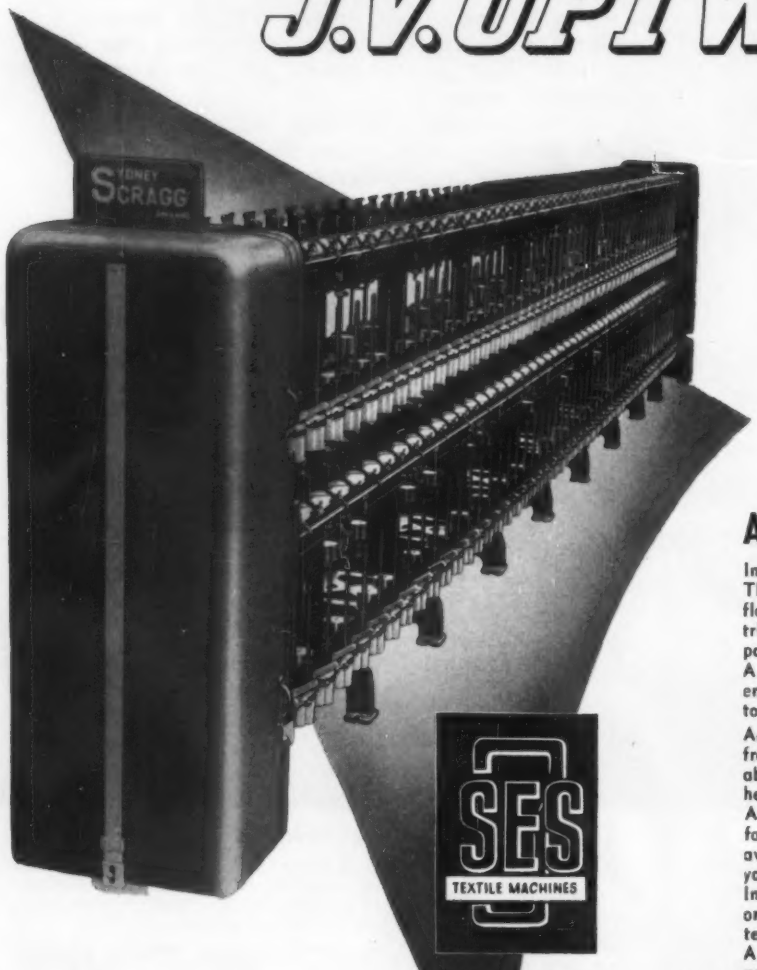
Engineers and Builders of Hydraulic Equipment Since 1921

Salute to a new era . . .

Experience, foresight and enterprise have been combined to produce this latest addition to the SES range of Textile Machines. It heralds a new phase in uptwisting and sets a pattern of standardization which has been long overdue. Future trends have been anticipated, for it takes larger packages, an infinite variety of yarns and has speeds far in excess of present day standards.

Welcome then
THE SYDNEY & E. SCRAGG

J.V. UPTWISTER



A GALAXY OF NEW FEATURES

Including:—

The Mark II Super Heavy Duty Roller Bearing Sescoflex Spindle incorporating the virtually indestructible triple "Hycar" suspension system dealing with larger packages at higher speeds.

A new and unique constant belt pressure spring is employed which gives an unprecedented steadiness to the spindle under the most arduous conditions.

Additional strength has been built into the machine frame which has been futher cross-braced, giving absolute rigidity, making it eminently suitable for the heaviest foreseeable packages.

An entirely new support structure has been adopted for the Traverse rails, making the Traverse the finest available and signifying a great advance in processing yarns at high speed while inserting low twists.

Individual drive to each deck. The motors are carried on long slides with a new positive self-adjusting belt-tensioning mechanism.

A new type non-lifting, roller bearing, light alloy jockey pulleys on hardened and ground nickel chrome spindles with large capacity oil reservoirs.

SYDNEY & E. SCRAGG LIMITED
OXFORD ROAD WORKS, MACCLESFIELD
TELEGRAMS: 'PARKMIL' MACCLESFIELD, ENGLAND

ANNOUNCING!

...A TOTALLY NEW NEEDLE LUBRICANT
for fine-gauge full-fashioned and seamless knitting machines

SHELL VEXILLA OIL 117

1. **12 TIMES GREATER RUST PROTECTION** than the best current oils . . . during both operating and shutdown periods.

2. **Eliminates green soap formation,** and minimizes machine oxidation.

3. **Controls nylon size deposits,** and permits easy cleaning during shutdown periods.

4. **Very low surface tension,** resulting in increased wetting and lubrication.

5. **No gummy deposits . . .** contains no fatty acids.

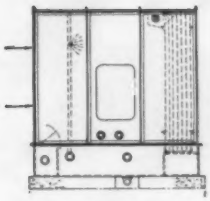
Shell VEXILLA OIL 117 establishes a new set of standards in knitting machine lubrication. Test it in comparison with the oil you are using. Write for further information.

SHELL OIL COMPANY
50 West 50th Street • New York 20, New York

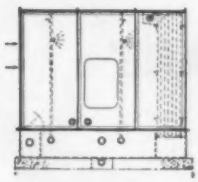
SHELL

6 time-proved AIR WASHERS

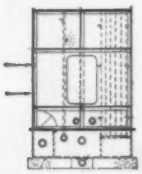
— and what they can do for you!



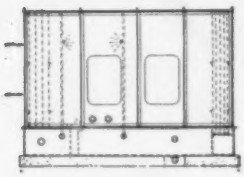
"Buffalo" TYPE A — HUMIDIFYING AND AIR CLEANING. In this efficient, highly practical unit, air flows thru a dense curtain of atomized spray, into a large space for thorough mixing of air and spray, then thru wetted-down corrugated eliminator plates — cleaned, cooled and humidified. Resistance is only ¼" static.



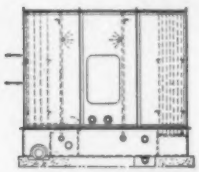
"Buffalo" TYPE B — DEHUMIDIFYING AND AIR CLEANING. Using the same flooded eliminator plate and tank construction as the Type A Washer, Type B has two banks of sprays in a 95" long chamber. Either or both banks can be shut off to regulate humidity in summer. Available also as a spray dehumidifier.



"Buffalo" TYPE C — HUMIDIFYING AND AIR CLEANING IN RESTRICTED SPACE. For ventilating systems where the best possible air washing, cooling and cleaning at least expense is desired, this design gives excellent results. Having a shorter (56") spray chamber and a single bank of sprays, it has the same removable eliminator plates with five corrugations as Types A and B.



"Buffalo" TYPE H — HIGH EFFICIENCY HUMIDIFYING WITH MINIMUM PUMP POWER. Their two banks of sprays operate with as little as 37 lbs. pressure on the spray headers. Type H is particularly suited to humidifying problems requiring large volumes of air, as in textile mills.



"Buffalo" TYPE T — DEHUMIDIFYING AND HUMIDIFYING. Providing efficient cooling and humidity control by spraying chilled water, this space-saving design is widely used for industrial air processing as well as comfort cooling in public buildings.

"Buffalo" WET GLASS CELL AIR WASHERS FOR DUST-FREE CONDITIONED AIR. These units combine "Buffalo" Air Washer features with sprayed glass filament filter cells — not only providing humidity control and cooling, but practically eliminating airborne dust.

"Buffalo"

BUFFALO FORGE COMPANY

184 MORTIMER ST. BUFFALO, N. Y.

Publishers of "Fan Engineering" Handbook

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

for lower cost control of moderately **Corrosive** fluids

Fig. 2651-A Gate

JENKINS

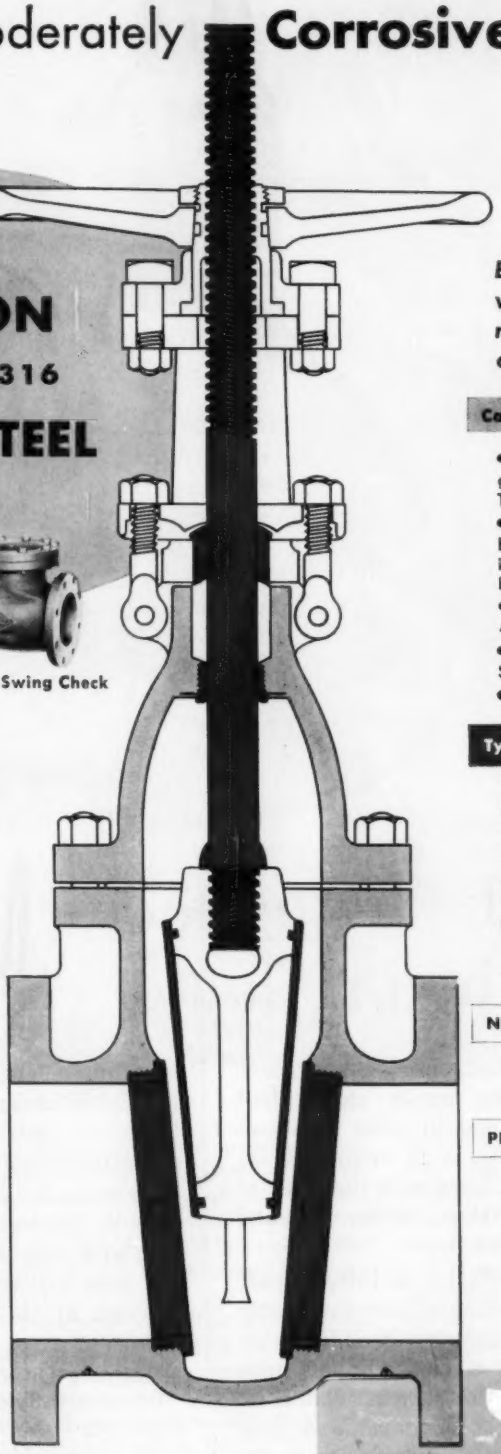
NICKEL IRON

Valves with Type 316

STAINLESS STEEL

Trim

Fig. 2624 Swing Check



This combination provides corrosion resistance well above the moderate need in many processing services with an investment well below that for all-stainless steel valves.

Designed primarily for the chemical process industries, they are recommended for control of mildly corrosive liquids with minimum quantities of mineral acids, such as creosote in wood treatment, and many liquids carried in petroleum processing.

A major use is in pulp and paper processing, particularly in lines serving the digester, and in the chemical recovery cycle. Service records in lines carrying the valve-punishing "black liquor" give Jenkins Nickel Iron Valves top performance rating.

Jenkins *extra value* construction throughout. Get details — compare. See why they stretch your valve investment dollar — with longer service life, lower maintenance cost.

ALSO RECOMMENDED for fluids used in electroplating, photograph finishing, textile bleaching, dyeing and finishing and heat treating of metals.

Every part in contact with fluid is the right metal to block corrosion and beat wear.

Cast NICKEL IRON

- **BODIES** Heavy duty, dimensioned for greater resistance to wear and abuse. Through port design in Gate Valves.
- **BONNET** Rugged construction, like body. Swing-type gland bolts. Screwed-in back-seating bushing. Deep stuffing box.
- **YOKE** Integral with bonnet in 2″ to 4″ sizes.
- **WEDGE** In 10″ to 24″ sizes, with Stainless Steel Wedge Rings.
- **COVER** In Check Valve.

Type 316 STAINLESS STEEL

- SPINDLE
- GLAND
- BONNET BUSHING
- SPINDLE RING
- WEDGE PIN
- WEDGE RINGS Rolled into Nickel Iron Wedge in 10″ to 24″ sizes.
- SEAT RINGS
- DISC and HANGER in Check Valve

NI-RESIST Type No. 2

- WEDGE of I-beam structure is solid NI-RESIST in 2″ to 8″ sizes.

PRESSURE RATINGS

2″ to 12″—200 lbs. O.W.G.
14″ to 24″—150 lbs. O.W.G.

GET COMPLETE SPECIFICATIONS from your Jenkins Valve Distributor, or write: Jenkins Bros., 100 Park Ave., New York 17. Ask for Bulletin 118.

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES
SINCE 1864 TRADE JENKINS MARK
Jenkins Bros

The better factory lamp that banished reflector cleaning forever

DIRTY LAMP REFLECTORS WASTE LIGHT. Cleaning them costs money; slows plant traffic. To put an end to these twin nuisances, Sylvania Research engineers designed a "high bay" lamp with the reflector *inside* the glass envelope, where dust and grime can never reach it.

By making the reflector an integral part of the lamp, illuminating efficiency is greatly improved, too. The Sylvania R-52 Reflector Lamp concentrates a clear, bright light directly on the working area. The R-52 gives more usable light for the same wattage —plus total freedom from reflector maintenance costs.

Now—in factories, processing plants and foundries across the nation—this outstanding Sylvania lamp is giving more light at lower cost; setting new high standards for industrial illumination.

Sylvania R-52 Reflector Lamps are available in 500-watt and 750-watt sizes. For help with your industrial lighting problems, call your Sylvania Representative or write to Dept. 5L-5212, Sylvania.

SYLVANIA ELECTRIC PRODUCTS INC.
Lighting Division, Salem, Massachusetts
In Canada: Sylvania Electric (Canada) Ltd.
University Tower Building, St. Catherine Street, Montreal, P. Q.

Lighting • Radio • Electronics
Television • Atomic Energy

Keep your eye on SYLVANIA
... fastest growing name in sight

How Correct Lubrication cured them—saved $1,700 a month!

They were like giant spiders spinning endless threads. Only, these were *man-made* "spiders"... their sinews were gears, shafts and bearings—their lifeblood was oil. But this lifeblood kept vanishing, leaving these spinners constantly hungry for oil.

There were 140 of these spinning units in a large rayon mill. Each unit contained many "Godet" boxes—reservoirs of oil to lubricate vital moving parts. Every day, each unit was short two gallons of oil—a total of 280 gallons.

A Socony Mobil man, making a lubrication analysis of this plant, asked one of his staff engineers to work with plant personnel on this problem. They found the cause... rotation of a shaft protruding from each Godet box caused oil to travel along the shaft out of the box and drip off.

To remedy this, they cut a spiral groove in the shaft so as to force the oil back into the box. They also changed to a heavier grade of oil. As a result, oil loss was drastically cut, saving the company $1,700 a month!

Engineering service like this comes with our program of Correct Lubrication. Why not call us and get such a program started in *your* plant?

SOCONY MOBIL *Correct Lubrication*

FIRST STEP IN CUTTING COSTS

SOCONY MOBIL OIL CO., INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.
Formerly Socony-Vacuum Oil Company, Inc.

you can

Dollars of ***FIRST COST*** *aren't so big...*
if they're the ***LAST COST***

Write for your Copy:
AL STAINLESS STEEL
Report to the
Textile Industry

40 pages of useful information on the applications and advantages of stainless steel in textile plant equipment of all types. Well illustrated—also contains a technical section of data on selection and fabrication, etc.

ADDRESS DEPT. TW-72

First cost isn't everything! What really counts in most cases is not how much a thing costs when new, but how long it lasts; how *little* it actually costs when reckoned in terms of extra years of service.

That is where AL Stainless jumps to the head of the class. Stainless steel is a package of built-in advantages you just can't match anywhere else. No other commercial material is at once as hard, strong and lastingly beautiful—as resistant to heat, wear and corrosion—as easy and inexpensive to clean and maintain.

To top it off, AL Stainless is easy to fabricate, and we produce it in every shape or form a fabricator may require. Check up on its money-making possibilities for *you*, either in your products or your equipment, *and let us help!* ● ***Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.***

W&D 5483-D

Make it BETTER-and LONGER LASTING-with

AL Stainless Steel

AL ALLEGHENY LUDLUM ®

Warehouse stocks carried by all Ryerson Steel plants

you can BET on Franky

the horse of another color!

✔ to **WIN** your customer's confidence

✔ just **PLACE** your orders with us

✔ we'll **SHOW** you fast colors and quality yarns

Franklin Process

COTTON YARNS & CUSTOM YARN DYEING . LARGEST PACKAGE DYERS IN THE WORLD

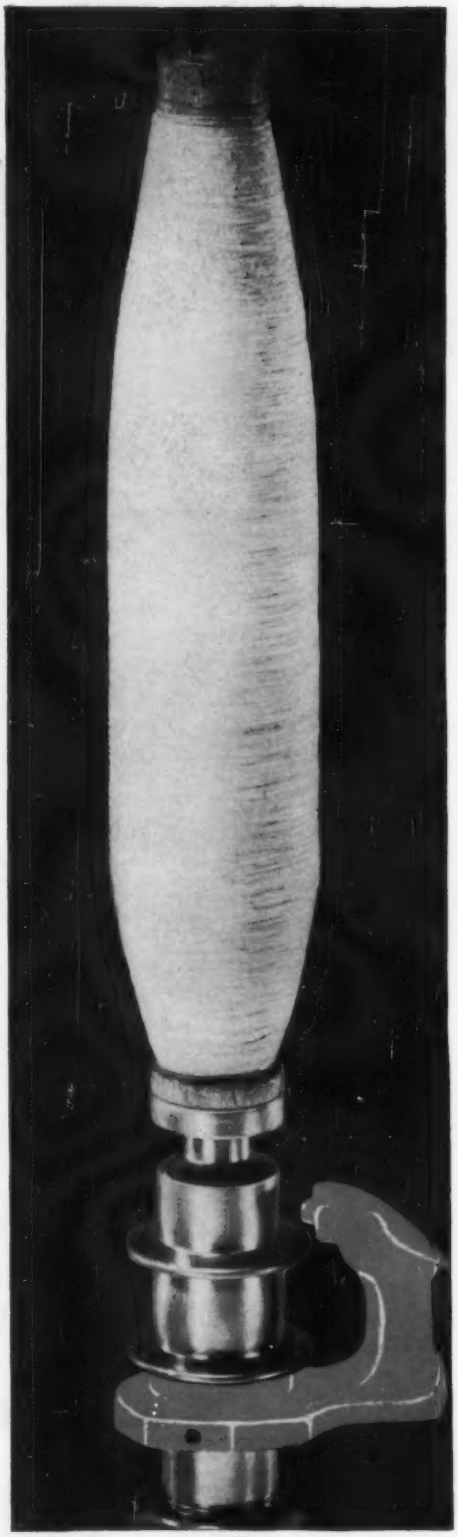
PROVIDENCE • PHILADELPHIA • GREENVILLE

CHATTANOOGA • FINGERVILLE, S. C.

New York Representative — 40 Worth Street

keep spindles spinning clean and true with

Gulfspin



Spindles will stay clean and spin true when you use Gulfspin. This remarkable spindle oil resists sludge formation, holds contaminants in suspension so they do not deposit on spindle parts, and provides effective protection against rust.

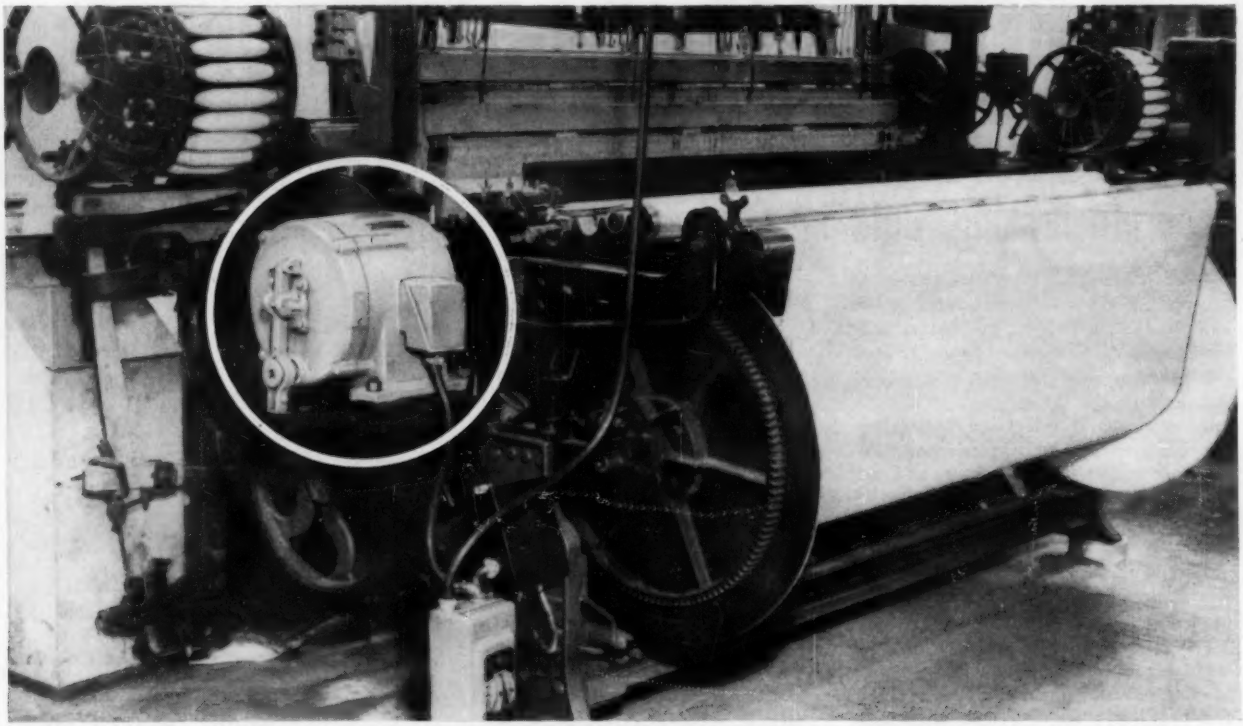
You also reduce power costs with Gulfspin. Ordinary spindle oils often thicken after a few months of service, requiring increased power. Gulfspin shows no increase in viscosity after many months of service. You'll find that these advantages add up to smoother spindle operation, fewer ends down, and rock-bottom maintenance and power costs.

Consult the telephone directory for the number of your nearest Gulf office. Then contact a Gulf Sales Engineer and let him prove the superiority of Gulfspin on your frames.

Gulf Oil Corporation • Gulf Refining Company
Pittsburgh 30, Pennsylvania

GULF

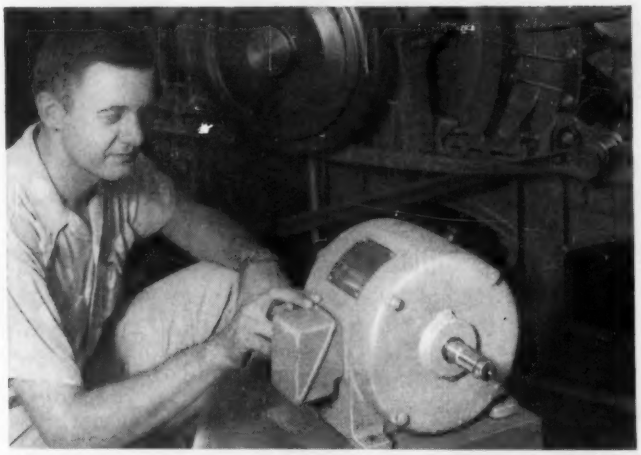
THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS



LOOM PERFORMANCE IS IMPROVED by the new G-E clutch-brake loom motor. Stops are fast and accurate. Braking system is simplified for excellent repeatability, less upkeep. Five years of testing and development with the Draper Corp., Hopedale, Mass., stand behind the G-E clutch-brake motor. This testing assures better performance for you.

General Electric announces . . .

NEW clutch-brake loom motor and cotton-card motor for the textile industry



SOUTHERN STATES EQUIPMENT COMPANY, card drive manufacturer, finds the new G-E cotton-card motor offers unusual flexibility in installation and operation. This enclosed, thermostat-protected motor is suitable for operation in lint atmosphere.

General Electric's new clutch-brake and cotton-card motors are ready to help you increase your mill's output with less maintenance, less down-time and smoother operation. Outstanding examples of G-E product development, these motors illustrate the benefits offered to the textile industry by continuing G-E engineering research. It is this kind of engineering service that is available to you when you specify General Electric components for your textile equipment.

Why not take advantage of G.E.'s experience in the textile industry to help you protect your equipment investment with products like those described here?

DETAILS ON NEXT TWO PAGES ▶

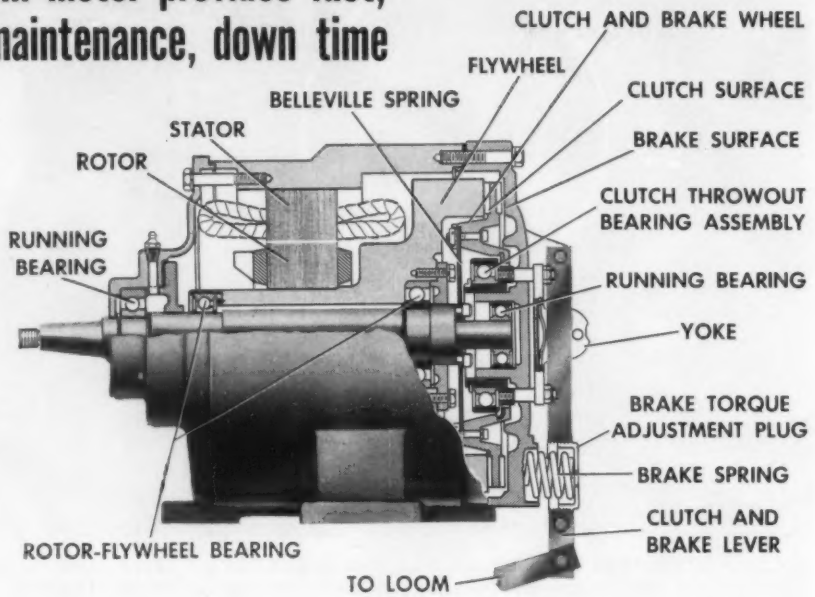
GENERAL ELECTRIC

LATEST G-E PRODUCT DEVELOPMENTS

CONTINUED FROM PREVIOUS PAGE

NEW G-E clutch-brake loom motor provides fast, accurate braking, cuts maintenance, down time

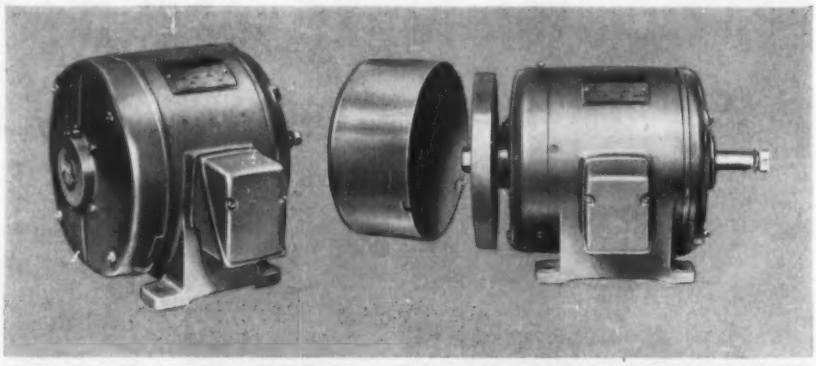
The self-contained, simplified design of General Electric's new clutch-brake loom motor helps you get better performance with less maintenance. Clutch and brake are integral parts of the unit, designed for better protection against lint, grease and oil. High inertia reduces the variation in speed caused by loom's fluctuating load. Fast and accurate braking make the loom stop in the same position each time. Electrical design is not penalized by the new mechanism, so adequate torque is assured even under adverse operating conditions. Only two bearings, carrying no thrust loads, operate while the loom is running, and other bearings operate only during idling or clutching and braking. This, together with simplified assembly and disassembly and improved insulation, minimize motor maintenance and loom down time.



NEW G-E standard and flywheel loom motors give smoother operation, maximum production

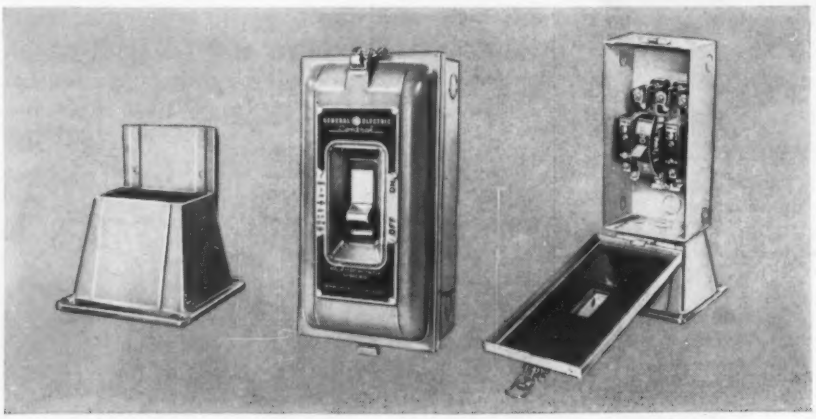
Smoother, more dependable service on high-speed looms is standard with new General Electric loom motors. The sturdy Tri-Clad* "55" design adds extra life and reliability. By making the internal flywheel entirely separate, the best electrical design for high efficiency and high operating power factor is obtained. Where your applications require extra-high inertia, an extra **external** flywheel can be fitted on the standard G-E loom motor allowing it to do a larger motor's job, with more effective picking, more constant speed, reduced power costs.

*Registered Trade-mark of the General Electric Co.



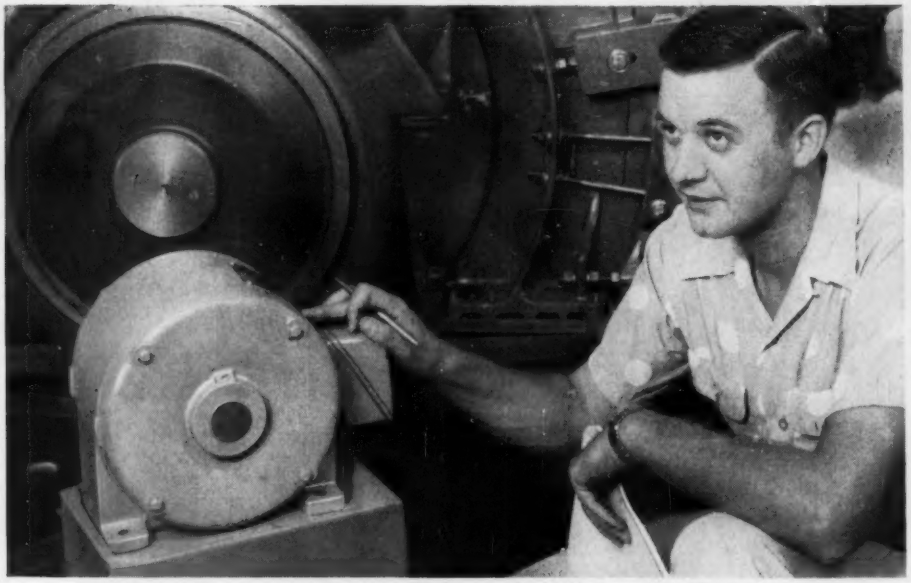
NEW TRI-CLAD "55" LOOM MOTOR . . . CAN BE FITTED WITH EXTERNAL FLYWHEEL

NEW G-E loom switch is completely dust- and lint-tight, mounts on loom, wall or pedestal



Listed by both Underwriters' Laboratories, Inc., and Factory Mutual, General Electric loom switches keep your motors running full time. Lint and dust cannot enter around the recessed toggle handle. A die-cast aluminum slide which engages the switch handle is sealed against a cotton-felt gasket which is moisture-, fungus-, and insect-proof. Also, a cork-neoprene gasket inside the cover seals between the cover and the box. The switch can be turned around in the enclosure so that line terminals can be located at either top or bottom. The switch is easy to remove from the pedestal for servicing, and the flexibility of its mounting makes it an ideal control for use in textile mills.

IMPROVE TEXTILE MILL PRODUCTION

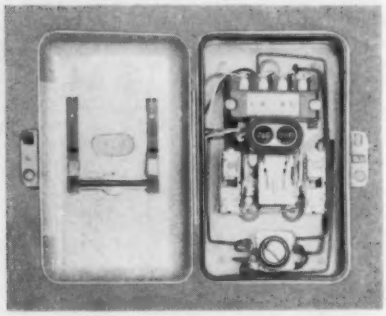


NEW G-E Tri-Clad* "55" cotton-card motor offers higher full-load speeds, short axial length to save aisle space

Selection of the right motor for your cotton-card needs is simplified by the availability now of General Electric's new cotton-card motors in Tri-Clad "55" design. From bearing nose to bearing nose, it is only 9½ inches long, an important factor in mills where space is at a premium between cards. All the advantages of individual motor drives, from elimination of belts to flexibility of plant layout, are inherent in this new motor, but G-E design engineers have added other advantages. You can adapt these motors to your special needs whether you use cog belt, chain, V-belt and gear, flat belt and gear, or V-belt drive. Whatever system you use, you are assured of excellent motor performance. You get higher full-load speeds with reduced operating noise, better all-round performance. Greater rigidity and strength, added to an improved insulation system, mean that you can expect even longer life. Maintenance required is minimum, and servicing is convenient, because G.E. has designed an advanced bearing system that requires little attention. Conduit boxes are accessible and bolts go in easily, making installation a quick easy job.

Available in the new, smaller NEMA 213 frame size in a totally enclosed, non-ventilated enclosure, this new G-E motor is rated 1½ hp, 6-pole, high-torque, and built to help you get maximum output from your cards.

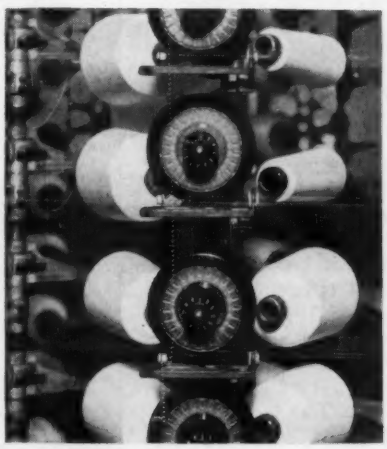
*Registered Trade-mark of General Electric Co.



NEW G-E cotton-card starters in smaller size NEMA frames

More dependable full-voltage starting of your equipment is assured with G.E.'s new small-size cotton-card starters. The new starter is only 11 1/8 in. high, 7 1/2 in. wide and 5 3/4 in. deep. Designed specifically for cotton card service, the new starter has a reversing switch inside the cover for periodic reversing of the card, to sharpen the points on the comb needles. During normal operation the cover is closed to help prevent accidental reversing of the switch. A start-stop push button in the cover makes operation easy and eliminates mounting of a separate device. A spring latch holds the hinged cover tightly against a neoprene gasket to seal out lint. The cover can be screwed closed or padlocked. Specify this new small-size cotton-card starter for more dependable control of your cards.

G-E frictionless tension brakes help produce more uniform yarn



Textile operators can hold all ends at the same tension, from creel to warper, with G-E magnetic yarn-tension brakes. Magnetic hold-back action maintains tension of individual ends constant at all warping speeds. Simple and compact, the brake gives more uniform, high-yardage warps, fewer ends down at the slasher and in the weave room, and eliminates wide tension vibration, excessive flexing, surface clogging and wear. The brake includes a rotor and a stator, both containing Alnico magnets so designed and mounted that the magnetic restraining force is essentially constant at all speeds. Many mills are using these G-E tension brakes for synthetic yarns and glass fibers as well as natural yarns.

FOR MORE INFORMATION on G-E motors and control for textile mills, contact your local G-E Apparatus Sales representative, or write for bulletins to General Electric Co., Section 654-37, Schenectady, N. Y. Available now are: GEA-6350 on Clutch-brake Loom Motors; GEA-5858A on Standard and Flywheel Loom Motors; GEA-6001 on Lint-tight Loom Switches; GEA-5867 on Tension Brakes.

Engineered Electrical Systems for Textile Mills

GENERAL ELECTRIC

HIGH-FINISHING OUTPUT of dyeing range is speeded by G-E direct-current motors. In this installation, packaged Speed Variator power unit was located out of range area to save floor space.

G-E packaged range drive steps up output, cuts down maintenance

INCREASED PRODUCTION—G-E packaged Speed Variator range drive supplies the flexibility and close-speed control you require for continuous operation of textile-finishing equipment. Providing easily controlled speeds that are smoothly adjustable over a wide range, this packaged system keeps motors exactly co-ordinated, maintains constant cloth tension and helps improve quality of goods.

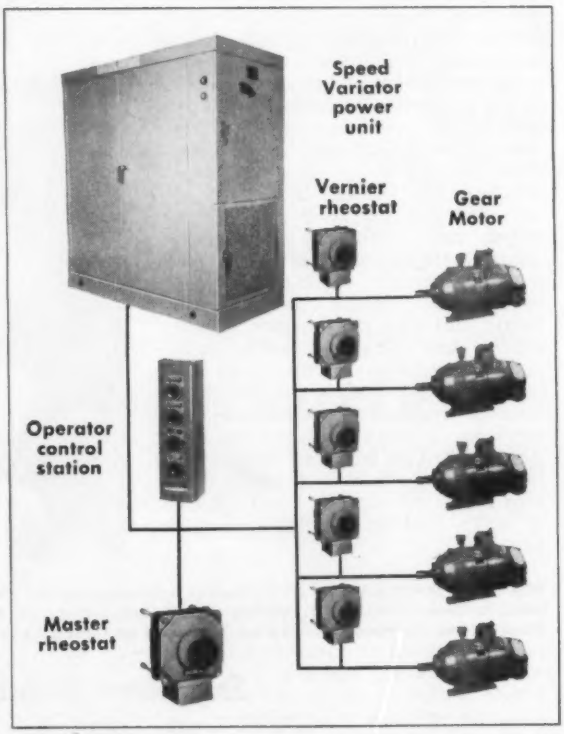
EASY INSTALLATION—Compact Speed Variator power unit is delivered to you completely wired, assembled and tested. No special foundation is required, and unit may be placed in any convenient location.

SIMPLE OPERATION—Speed of the entire range is controlled with a simple rheostat dial or by remotely mounted push buttons. After initial adjustment, co-ordination of the driven range is completely automatic.

LESS MAINTENANCE—Smooth operation and sturdy construction of General Electric's packaged range drive reduces maintenance time and expense. All components of Speed Variator unit are protected within positive-pressurized cabinet and are easily reached through hinged doors. Inexpensive, replaceable glass-fiber filters help keep lint and dirt from packaged power system. The G-E three-piece gear-motors require no special mounting and may be removed for servicing without disconnecting gears.

ENGINEERING HELP—To learn more about range drives and the advantages that adjustable speed can bring to your operation, contact the textile expert at your nearest G-E Apparatus Sales Office. Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania. 815-6

GENERAL ELECTRIC



QUICK, FINGER-TIP CONTROL of entire range is provided by push-button control system and master rheostat. For easy, low-cost installation, controls and Speed Variator power unit can be installed in any convenient location.

THE WHOLE STORY . . .

DENMAN *Pioneered*

THE RUBBERIZED FABRIC PICKER

Through continuous research and picker improvement Denman has always been "first with the best". Watch Denman closely for *new developments* and the latest in *operating efficiency and economy*.

MADE BY DENMAN TIRE & RUBBER CO.

EXCLUSIVE SALES REPRESENTATIVE:

THE Terrell

MACHINE COMPANY, INCORPORATED

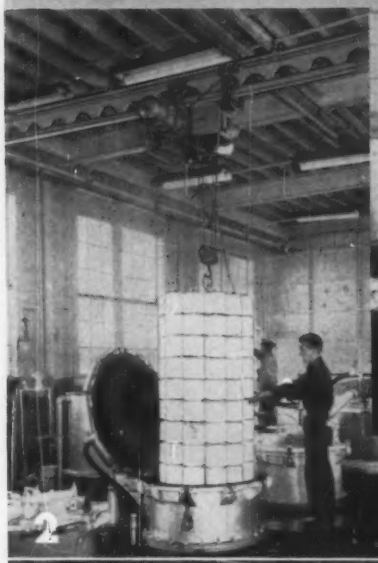
Charlotte, North Carolina

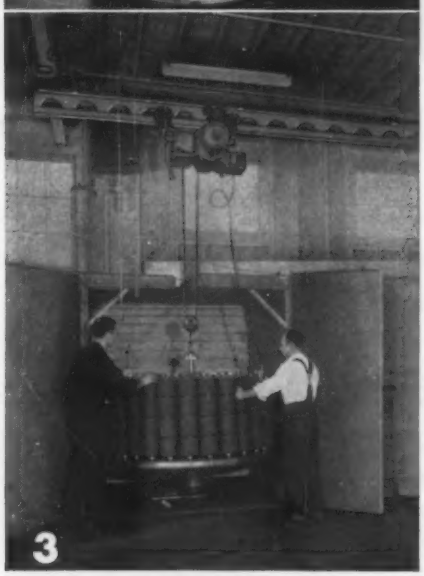
 For more information, write direct or use Reader-Service post card.

1 Loading a 500-lb. package dyeing machine with the Tramrail Crane. This same 2,000-lb. capacity hand-propelled crane with electric hoist is used for handling operations shown in other illustrations.

2 Lowering a load into a 300-lb. dyeing machine.

3 Placing a load of yarn into a drying chamber.





Package Dyeing and Drying Made Easy

Handling packaged yarn through dyeing machines, extractors and drying chambers is fast and easy when Cleveland Tramrail equipment is provided.

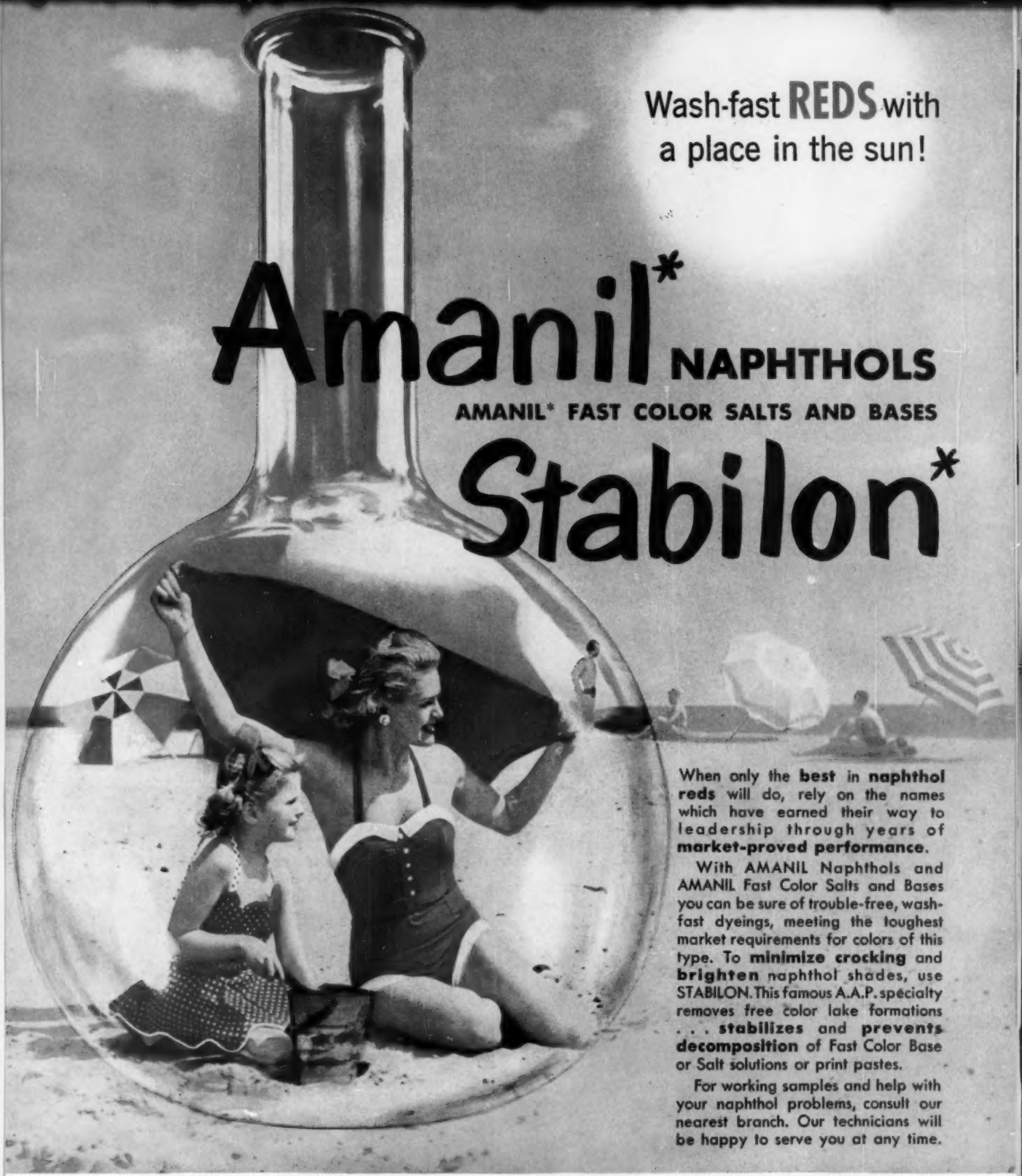
Carolina Insulating Yarn Company, Winston-Salem, N. C., is one of many textile mills that have found it profitable to use an inexpensive hand-propelled crane with electric hoist to do this work. They have eliminated the need of hard manual lifting and hauling. As a result, production has been stepped up, costs cut and safety aided.

Because so many important advantages ensue from the installation of Cleveland Tramrail equipment, we urge you to study your handling operations and check with a local Cleveland Tramrail engineer as to what can be done to best serve your needs.

GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
8475 EAST 287th St. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT



Wash-fast **REDS** with a place in the sun!

Amanil* NAPHTHOLS

AMANIL* FAST COLOR SALTS AND BASES

Stabilon*

When only the **best** in **naphthol reds** will do, rely on the names which have earned their way to leadership through years of **market-proved performance.**

With AMANIL Naphthols and AMANIL Fast Color Salts and Bases you can be sure of trouble-free, wash-fast dyeings, meeting the toughest market requirements for colors of this type. To **minimize crocking** and **brighten** naphthol shades, use STABILON. This famous A.A.P. specialty removes free color lake formations . . . **stabilizes** and **prevents decomposition** of Fast Color Base or Salt solutions or print pastes.

For working samples and help with your naphthol problems, consult our nearest branch. Our technicians will be happy to serve you at any time.

AAP

AMERICAN ANILINE PRODUCTS, INC.

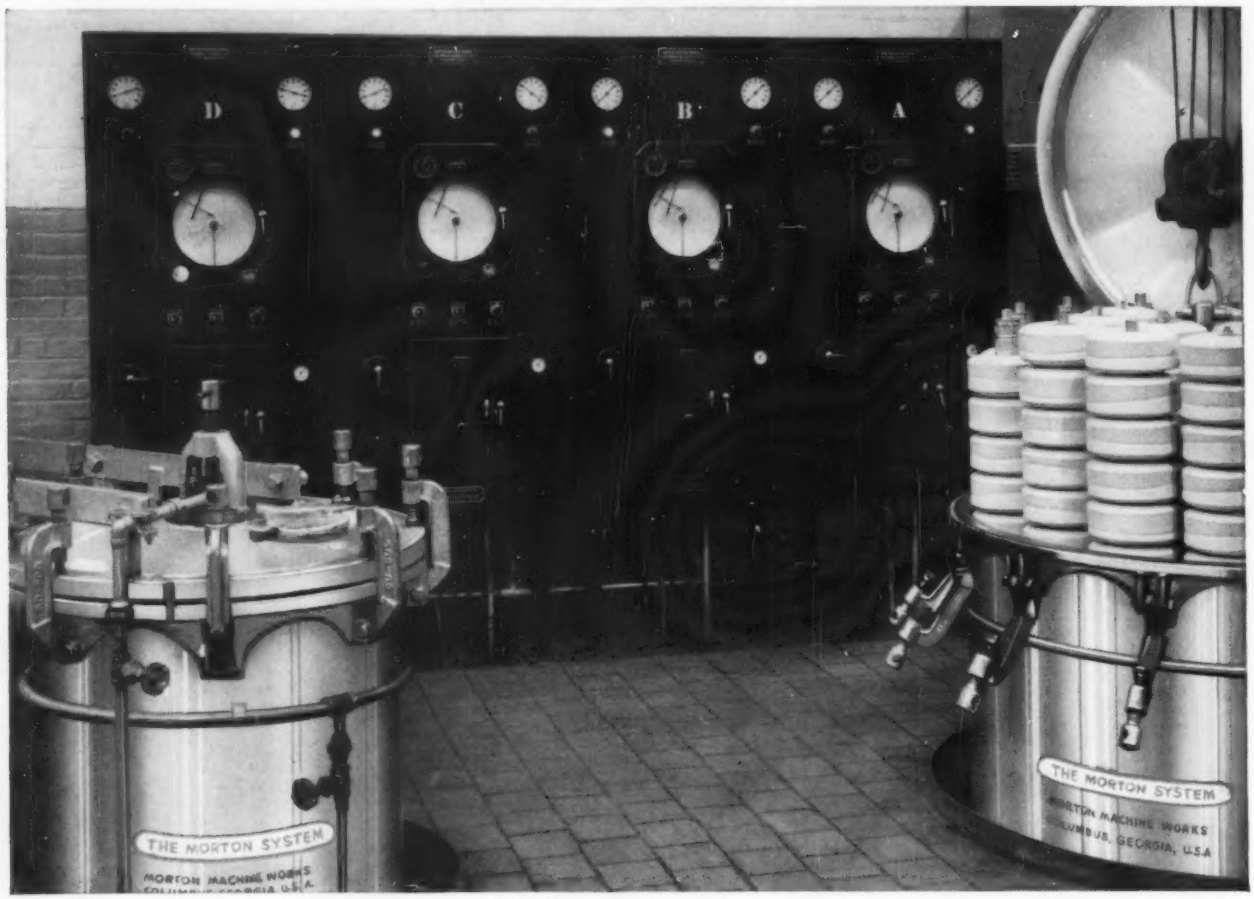
50 Union Square, New York 3, N. Y.
Plant: Lock Haven, Pa.

Branches:
Providence, R. I. • Philadelphia, Pa.
Paterson, N. J. • Chicago, Ill.
Charlotte, N. C. • Chattanooga, Tenn.
Columbus, Ga. • Los Angeles, Cal.

Dominion Anilines & Chemicals, Ltd.
Toronto, Canada • Montreal, Canada

*Reg. U. S. Pat. Off.

MONSANTO TEXTILE TALK



THEY NEVER SAY DYE...

without Taylor controls at Hathaway Manufacturing Co., New Bedford, Mass.

IN THE LAB, as well as on their Morton Machine Company package dyeing machines, they rely on Taylor automatic controls to deliver uniformly high quality at minimum cost. Instruments for each machine are mounted on a Taylor coordinated panel and comprise:

1. A FULSCOPE* Controller with Process Timer for automatic control of temperature and the time of the overall dyeing cycle.

2. A FLEX-O-TIMER* Time-Cycle Controller which operates the dye liquor reversing valve, giving a specific inside-out and outside-in cycle. It precisely times flow reversal, thus assuring greater uniformity.

3. Signal lights which let the operator see at a glance just what part of cycle he's in. They also let him know the direction of flow at any time.

This package dye control system is only one of the many ways you can "beat rising costs with Taylor Accuracy." Whatever dyeing problems you have, we can help you solve them by working out an efficient Taylor Automatic Control System for you. Ask your Taylor Field Engineer, or write Taylor Instrument Companies, Rochester, N.Y. or Toronto, Canada.

Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.

*Reg. U.S. Pat. Off.

Taylor Instruments MEAN ACCURACY FIRST

Guarantee TOP Performance and Maximum Life!

Specify THESE TOP QUALITY FEATURES...

MONSANTO TEXTILE TALK

BOTH TYPES OF RESLOOM* GIVE COTTONS A LASTING "WASH 'N WEAR" FINISH!

Which type of resin gives the most effective "wash 'n wear" finish to cottons? The controversy is raging—what is best for you?

If you favor a melamine resin, Monsanto recommends *Resloom HP* or *M-75*. If you prefer a cyclic-urea formaldehyde resin, Monsanto offers *Resloom E-50*. Both types of resins are compatible, and subtle yet significant changes in the finish for your cottons can be obtained through the use of a "blend." To determine what is best for your application, call on Monsanto—the only producer of cyclic urea and melamine-type resins.

Reslooms are outstanding in imparting dimensional stability and wrinkle recovery. Both types are remarkably durable. They do not wash or dry clean out of fabrics.

Unlike ordinary finishes, Resloom resins do not coat the surface. They are deposited inside absorbent fibers where they actually modify fiber characteristics.

A Monsanto representative will be glad to work with you on technical problems relating to "wash 'n wear" finishes. Write Monsanto Chemical Company, Plastics Division, Dept. TW-12, Springfield 2, Massachusetts.

It pays to finish fabrics with durable

RESLOOM *TEXTILE RESINS*

MONSANTO

RESLOOM: REG. U. S. PAT. OFF.

For More Profitable Wet Finishing . . .

Guarantee ***TOP*** *Performance and Maximum Life!*

Specify THESE TOP QUALITY FEATURES...

(Standard on Miller Cylinders at no extra cost)

Specify CASE HARDENED CHROME PLATED PISTON RODS
On all Air and Hydraulic Cylinders

Benefits To You

CASE-HARDENED Piston Rods (52-54 Rockwell "C") provide practically complete protection against damage from hammer blows, wrench-dropping, mishandling, and similar occurrences. ***Available from Miller at no extra cost.***

The HARD CHROME PLATING over the case-hardened rods protects against scratch-damage and rust. ***Available from Miller at no extra cost.***

Specify "TEFLON" WIPERS
On all Air and Hydraulic Cylinders

Benefits To You

"TEFLON" Rod Wipers and "TEFLON" Hydraulic Piston Rod Seals withstand temperatures from—100°F. to plus 500°F. They are impervious to practically all known chemicals, including the fire-resistant, special, and standard hydraulic fluids in current use. ***Available from Miller at no extra cost.***

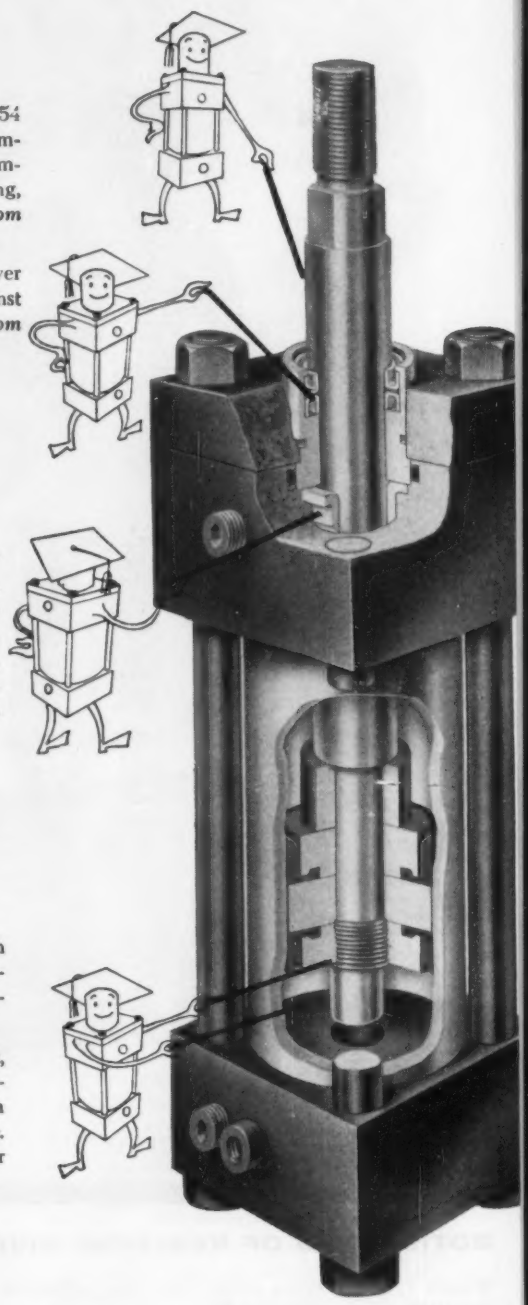
Specify TEFLON HYDRAULIC ROD SEALS
On all Hydraulic Cylinders

Specify RUST RESISTANT SURFACES
On all Air and Hydraulic Cylinders

Benefits To You

Highest quality Black Ferric Oxide Finish provides rust protection in air cylinder operation and on all cylinders during shipping and installation.

Cylinder heads, caps, mountings, pistons, followers, tie rods, and the unplated portions of the piston rods have this finish ***at no extra cost on all Miller cylinders.*** (This finish not recommended for water service)



You may wish to route this entire page to the proper department in your company, by using this handy form. Additional copies on request. →

To (Dept.)_____

"On all our future cylinder requirements, please specify the above quality features."

Signed_____

Title_____

EFFECTIVE DATES

These new Miller features will be provided at no extra cost after January 1, 1956—and at Miller's option prior to that date.

SALES AND SERVICE FROM COAST TO COAST

CLEVELAND • YOUNGSTOWN • DAYTON • TOLEDO • CINCINNATI • COLUMBUS
PITTSBURGH • PHILADELPHIA • BOSTON • HARTFORD • NEW YORK CITY
BUFFALO • ROCHESTER • MINNEAPOLIS • GRAND RAPIDS • DETROIT • FLINT
FORT WAYNE • SOUTH BEND • INDIANAPOLIS • MILWAUKEE • LOUISVILLE
KANSAS CITY • SEATTLE • LOS ANGELES • SAN FRANCISCO • BALTIMORE
DENVER • ST. LOUIS • MOLINE • CHICAGO • HOUSTON • ATLANTA
TORONTO, CANADA and OTHER AREAS

Miller

MILLER FLUID POWER CO.

2002-06 N. Hawthorne Ave. Melrose Park, Ill.

AIR & HYDRAULIC CYLINDERS • BOOSTERS • ACCUMULA
COUNTERBALANCE CYLINDERS

A NEW CONCEPT IN INDIVIDUAL

For More Profitable Wet Finishing . . .

Whirlaway

(BALL BEARING)

EXPANDERS

. . . to smooth and spread fabrics wrinkle-free

WITHOUT STRAIN!

Whirlaway Expanders, available in one, two and three bar models, make wet finishing operations far more profitable because only Whirlaways offer *all* these superior features:

MINIMUM TENSION — restores the fabric to original width without damaging strain.

FREE TURNING — means less drag, less wear and longer life for the rubber (or neoprene) sleeve.

NEOPRENE END SEALS — protect bearings from chemicals, dirt, moisture.

NEOPRENE SHAFT BOOTS — cover exposed ends of shaft affording full protection for metal parts.

UNIVERSAL BALL AND SOCKET MOUNTS — Rugged, easily adjustable neoprene ball and socket mounted in cast iron brackets allow quick positive changes in angle for various fabric approaches.

SEALED-IN LUBRICATION — Shielded bearings are grease-packed for the life of the sleeve.

WHIRLAWAY EXPANDERS MAKE THESE MACHINES MORE EFFICIENT

Continuous Dyeing Machines	Mercerizing Ranges	Tenter Frames
Dry Cans	Open Width Washers	Dye Pads
Calenders	Quetsches	Water Mangles
Dye Jigs	Starch Mangles	

WRITE TODAY FOR BULLETIN XP 4

Leyland-Mycock Standard Expanders, for the fastest, most efficient *stretching* of fabrics, are available in one, three and five bar metal clutch or rubber covered models.

THOMAS LEYLAND MACHINERY CO., INC.

(Division of James Hunter Machine Company)

P.O. BOX 24 **READVILLE STATION** **BOSTON 37, MASS.**

SOUTHERN SALES & SERVICE: MARSHALL & WILLIAMS CORPORATION, 121 WELBORN STREET, GREENVILLE, S. C.

FORT WAYNE • SOUTH BEND • INDIANAPOLIS • MILWAUKEE • LOUISVILLE
KANSAS CITY • SEATTLE • LOS ANGELES • SAN FRANCISCO • BALTIMORE
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AIR & HYDRAULIC CYLINDERS • BOOSTERS • ACCUMULA
COUNTERBALANCE CYLINDERS

A NEW CONCEPT IN INDIVIDUAL ROOM AIR CONDITIONING!

All living rooms and bedrooms in the 230 apartments of New York City's smart new Randall House, designed by Boak & Raad architects, feature Airtemp "All-in-Wall" Air Conditioners built right in.

Airtemp installs new "All-in-Wall" units in 420 rooms in new Randall house

AIRTEMP BUILDS AIR CONDITIONING TO FIT ANY REQUIREMENT! Now, for those buildings where a central air conditioning installation does not meet all of your needs . . . Airtemp has developed "All-in-Wall" air conditioning . . . A new concept in individual room cooling. Look at these exclusive "all-in-wall" features:

Quiet! Airtemp engineered for super-quiet operation—no distracting motor noise—inside or out.

Individual Room Control! Each unit can be controlled by the tenant. Automatic thermostat is standard equipment.

Flush Outside! No outside projection to mar the beauty of the building.

Full Window View! Unit is out-of-the-way *under* the window . . . extends only inches into the room.

Full Capacity! Extra-high cooling capacity is engineered by Airtemp to meet the demands of the hottest weather.

Easy Installation! Eliminates expensive on-the-spot engineering costs in new or old buildings.

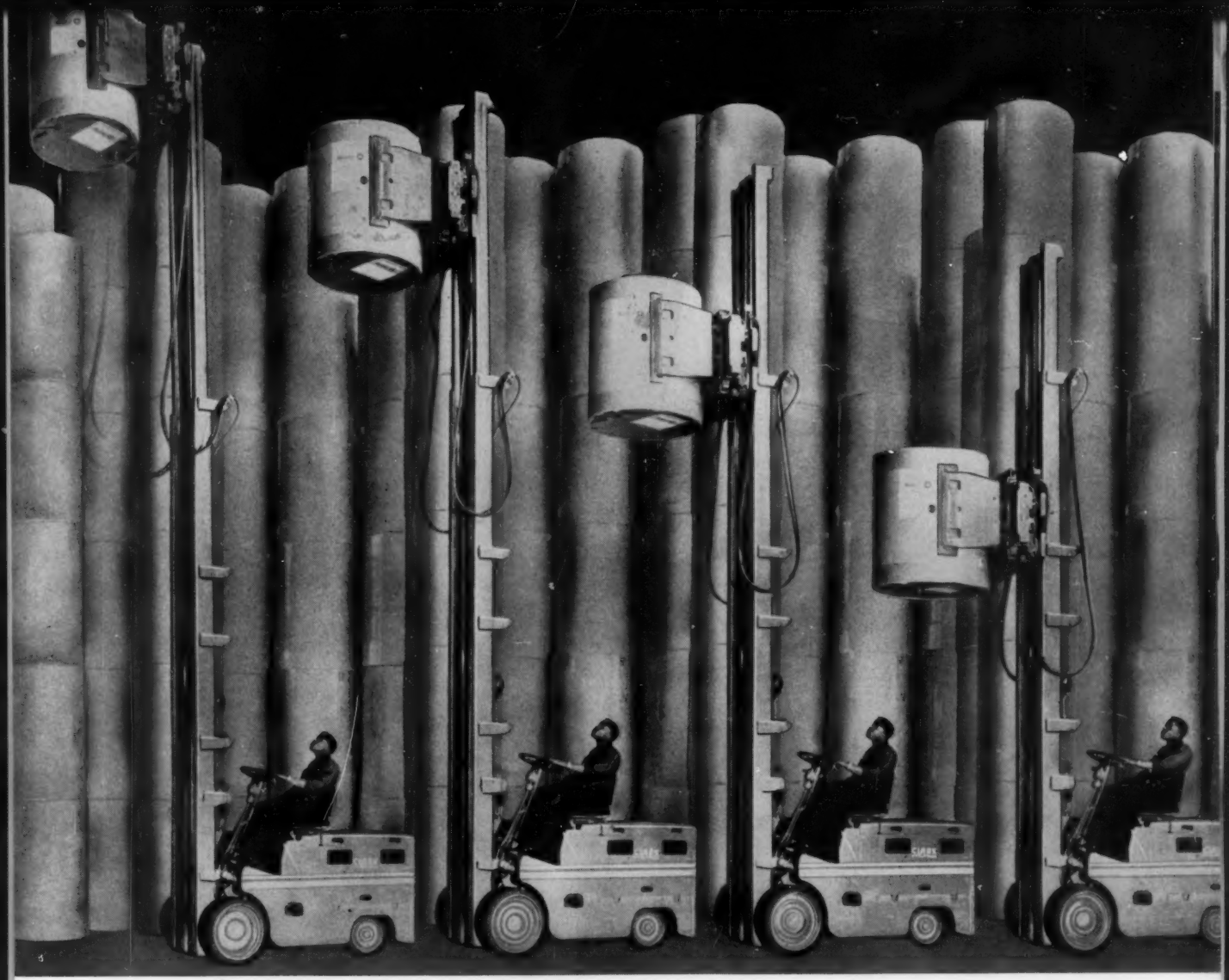
Easy Maintenance! Inside access plus identical cabinet size for ½, ¾ and 1 H.P. models.

Individual Metering! Each tenant absorbs the cost.

All these services are yours when you air condition with Airtemp . . . The top engineers of Airtemp Construction Corporation—local Airtemp servicemen—plus on the spot personnel equipped to guarantee efficient operation through all the years ahead. Write Airtemp Construction Corporation, Dayton 1, Ohio, for further details.

Airtemp
DIVISION
CHRYSLER CORP

AIR CONDITIONING FOR HOMES • BUSINESS • INDUSTRY



UP! UP! UP!

32 FEET HIGH!

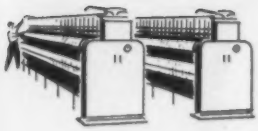
W. F. Hall Printing Co., Chicago—A 7,000 lb. Clark electric with a phenomenal 28′ 6″ upright, stacks rolls to the rafters. Here's the results—(1) full utilization of present storage facilities (2) improved stock segregation (3) faster handling (4) stock handling with an absolute minimum of damage.

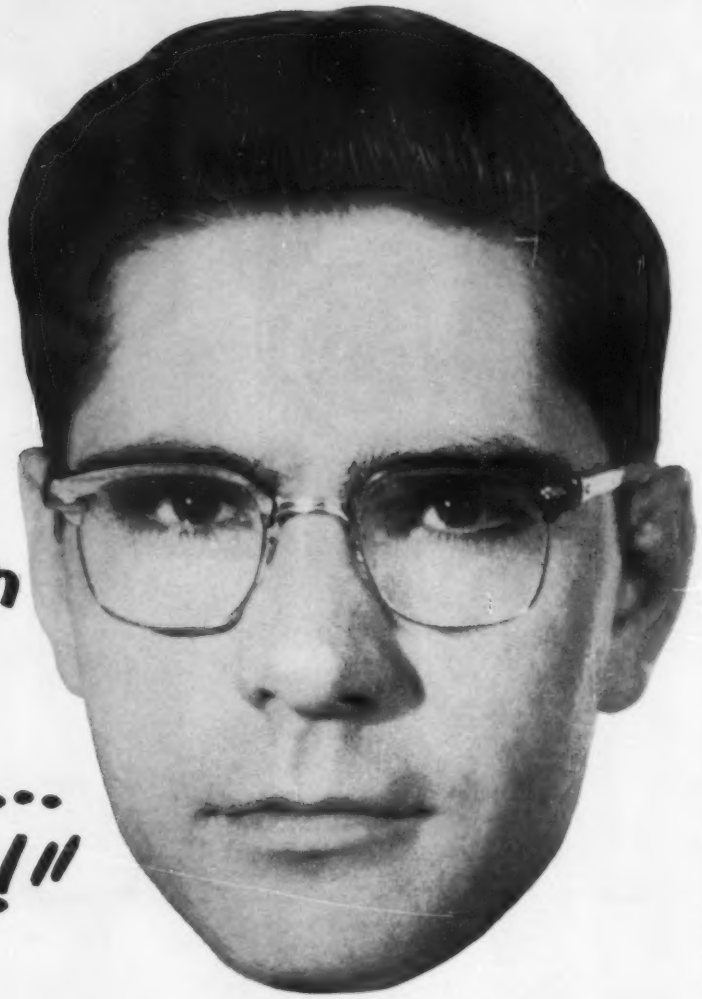
Have your local Clark dealer show you how to get the same UPward trend in your profits. Call him today . . . he's listed in the Yellow Pages under "Trucks, Industrial."

CLARK® EQUIPMENT

Industrial Truck Division, **CLARK EQUIPMENT COMPANY**, Battle Creek 27, Michigan

A BETTER BUY WITH LOCAL SUPPLY—*Genuine Clark Parts*





"One suggestion cut 'Seconds' to a minimum... ...costs by 1/3!"

A large South Carolina textile mill ran into lubrication trouble in its weave room—a high rate of cloth spoilage caused by leaking oil. The mill superintendent asked Sinclair Representative W. D. Cawley for his recommendations.

Oil dripped from bearings

Mr. Cawley reports: "The competitive oil being used in their looms was dripping from bearings onto the cloth and the floors. I suggested Sinclair NO-DRIP #15 because it combines a quality base oil for outstanding lubrication, together with a special soap thickening agent that resists leakage and throw-off.

Problem solved—lubrication costs cut...

"Since this mill has been using Sinclair NO-DRIP #15, seconds due to cloth spoilage have been cut to a minimum. What's more, lubrication costs have been cut by one-third!"

Why not let a Sinclair Lubrication Engineer help solve your lubrication problem. *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N.Y.

SINCLAIR LUBRICANTS

3 NEW reports on NIPTROL Mangle Performance

1. The Niptrol* Mangle *doubles* abrasion resistance and eliminates resin mark-off in the loop dryer in resin padding of synthetic gabardine suitings and spun shirtings.

2. The Niptrol Mangle gives *70% moisture retention* and cuts drying time on cotton terry towelling, replacing a journal-loaded extractor which gave 120% retention.

3. The Niptrol Mangle gives *30% more penetration in 40% of the time* in dye padding of 4- and 6-ply rayon bengalines, an enthusiastic user states.

These are not claims . . . these are *actual cases* reported by prominent textile mills which have used the Rodney Hunt Niptrol Pneumatic Mangle in commercial production. Write us for an appointment to run tests on your fabric or send for Bulletin No. 54.

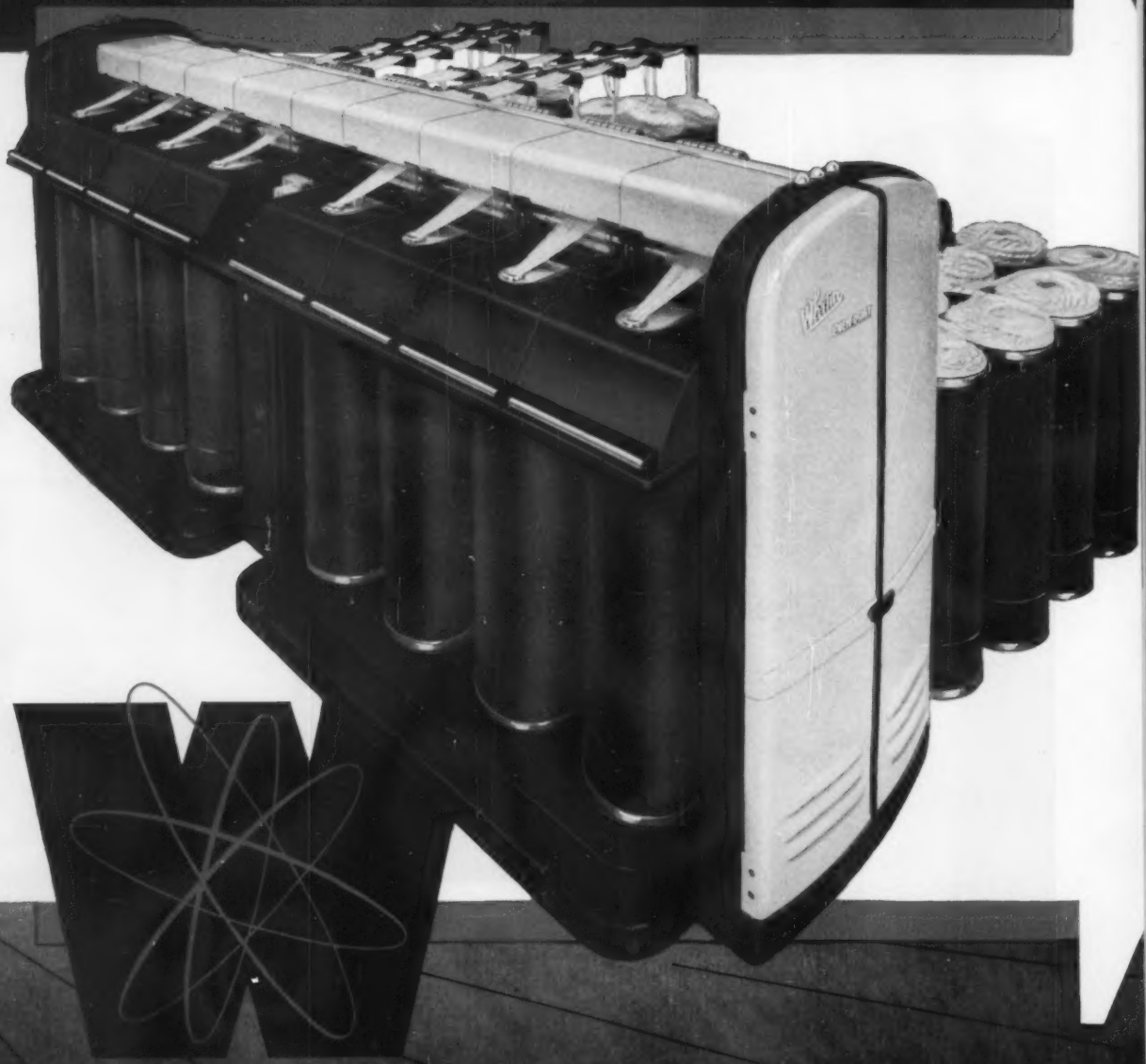
Niptrol Pneumatic Mangle in operation in a well known textile plant. The application of this machine to various processes and fabrics is rapidly broadening. *Niptrol, patents pending, is a trademark of Rodney Hunt Machine Co.

RODNEY HUNT

RODNEY HUNT MACHINE CO.

66 MILL ST., ORANGE, MASSACHUSETTS, U. S. A.

creating **NEW**



CHECK YOUR TEXTILE PROCESSING

HORIZONS in Drawing

the WHITIN Even-Draft* Drawing Frame

THE Whitin EVEN-DRAFT* Drawing frame is an entirely new textile machine which brings to the drawing process greatly advanced standards and levels of production, quality, flexibility and operation never before thought possible. It creates new horizons in drawing — in lowered machinery requirements — lessened costs — and from both direct and indirect benefits, greater mill profits.

- ★ **From 250-300 feet per minute Front Roll Delivery** — Production two to three times more than conventional machines, depending upon mill conditions and production needs.
- ★ **For all fibers up to 3"** — The first universal drawing frame — for cotton, spun synthetics and blends.
- ★ **Outstanding Sliver Quality** — Improved uniformity in both carded and combed sliver — 6 or 8 ends up.
- ★ **Pneumafil Clearer Units** — A brand new way of removing waste fibers. Developed for, and an integral part of, this machine.
- ★ **Entirely New Design** — Two independent four-delivery heads; vibration proof construction; precision tolerances; anti-friction bearings; unique four over five roll drafting; new overarm weighting; no-twist can table; electronic stop motions and signal lights; 14" – 15" – 16" cans, 36" or 42" high.

*Trade mark

Whitin MACHINE WORKS

WHITINSVILLE • MASSACHUSETTS

CHARLOTTE, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

CHECK YOUR TEXTILE PROCESSING AGAINST THESE SUPERIOR ONYX PRODUCTS

APPLICATION	DESCRIPTION	ACETATE	RAYON	NYLON	COTTON	SILK	DACRON	DESIGNATION
Antislip	FIBA WELD A	●	●	●	●			Water-Dispersible Resin
Antislip	FIBA WELD B	●	●	●	●			Water-Soluble Formaldehyde Condensate
Antislip	FIBA WELD PJ	●	●	●	●	●	●	Polymer Blend
Antistatic	CATEX	●	●	●	●			Quaternary Ammonium Product
Antistatic Agent	MOLLISAN	●	●	●		●		Non-Ionic Ester Type
De-embrittling Agent	MOLLISAN	●	●	●		●		Non-Ionic Ester Type
Dispersant	N S A E	●	●	●				Sodium Alkylnaphthalenesulfonate
Dispersant	MAPROFIX	●	●	●	●	●	●	Sodium Lauryl Sulfate
Dispersant	NEUTRONYX 400	●	●	●	●	●	●	Aromatic Polyglycol Ether
Dispersant	XYNOMINE	●	●	●	●	●	●	Sodium Amide Sulfate
Dye Fixative	XYNO FIX FL	●	●		●	●		A Complex Nitrogenous Condensate
Dye Fixative	XYNO SET B	●	●		●	●		An Imidazoline
Dyeing Assistant	ALIPHATIC ESTER SULFATE	●	●	●	●	●	●	Anionic Dyeing Assistant
Dyeing Assistant	N S A E PASTE	●	●	●				Sodium Alkylnaphthalenesulfonate
Dyeing Assistant	DARONYX					●		Dispersible Swelling Agent
Finishes								
Bodying	XYNO RESIN 362	●	●	●	●	●	●	Thermoplastic Synthetic Resin
Bodying	XYNO RESIN X99	●	●	●	●	●	●	Thermoplastic Synthetic Resin
Bodying	XYNO PERM 1591-60	●	●	●	●	●	●	Water-Soluble Protein
Crush-Resistant	N C F PASTE	●	●	●	●		●	Urea-Formaldehyde Resin
Crush-Resistant	LIQUID RESIN SS	●	●	●	●	●		Water-Soluble Urea-Formaldehyde Resin
Crush-Resistant Component	XYNO RESIN G-36	●	●	●	●			Aqueous Solution, Modified Urea-Formaldehyde Resin
Duller	DULLATONE CA	●	●	●		●		TiO_2-Base Cationic Dispersion
Duller	DULLATONE 60	●	●	●		●		TiO_2-Base Anionic Dispersion
Duller	DULLATONE AN 25	●	●	●				Resinated Dulling Agent
Fire Retardant	REPEL-O-FLAME SP		●	●	●			Mixture of Inorganic Salts
Hosiery Finish	ETERNALURE		●	●				Aqueous Dispersion of Synthetic Resin
Mildew Proofing	CATEX	●	●	●	●			Quaternary Ammonium Product
Mildew Proofing	ISOTHAN Q-15	●	●		●		●	Heterocyclic Cationic Complex
Moth Proofing	LARVONIL						●	Silicofluoride Salt
Ribbon Finish	XYNO RIBBON FINISH R	●		●				An Alkyd Resin
Sewability	XYNO FINISH 9909	●	●	●	●		●	Cationic-Nonionic Compounds
Shrink Resistant	CET		●		●			A Urea-Formaldehyde Derivative Resin
Taffeta Effects	XYNOTAF	●	●	●		●		Water Solution of Alkali-Soluble Alkyd Resin
Water Repellent Durable	REPEL-O-TEX ST	●	●	●	●	●	●	Silicone-Base Water Repellent
Water Repellent Durable	REPEL-O-TEX D3, D4	●	●	●				Heavy Metal Formate-Wax Emulsion
Water Repellent Renewable	REPEL-O-TEX 10-M	●	●					Aluminum Formate-Wax Emulsion
Softeners								
Anionic	VELVOSHEEN	●	●	●	●	●	●	Sulfonated Oil
Anionic	MAPROMOL HSY	●	●	●	●	●	●	Raw and Sulfated Fatty Alcohols
Cationic	ONYXSANS	●	●	●	●	●	●	Alkylimidazoline Hydroacetate
Heavy-Bodied	STEARYL GLYCERYL SULFATE N	●	●	●	●	●	●	Highly Sulfated Tallow
Non-Ionic	MOLLISAN	●	●	●	●	●		Non-Ionic Ester Type
Non-Yellowing	MOLLISAN	●	●	●	●	●		Non-Ionic Ester Type
Yellowing Resistant	XYNO FINISH 9909	●	●	●	●	●		Cationic-Nonionic Compounds
Gas Fading Inhibitor	NEUFUME DMX	●						Cationic Aromatic Amine Dispersion
Penetrant – Regular	PHI-O-SOL WA	●	●	●	●	●	●	Sodium Fatty Acid Ester Sulfate
Penetrant – Low Foaming	NEUTRONYX 511	●	●	●	●	●	●	Aromatic Polyglycol Ether
Scouring Agent	ONYXOL 9162	●	●	●	●	●	●	Fatty Acid-Alkanolamine Condensate
Scouring Agent	MAPROFIX	●	●	●	●	●	●	Sodium Lauryl Sulfate
Scouring Agent	MAPROTEX	●	●	●	●	●	●	Sulfated Fatty Alcohol Blend
Synthetic Detergent	NEUTRONYX 600	●	●	●	●	●	●	Aromatic Polyglycol Ether
Synthetic Detergent	SOROLENE G PASTE	●	●	●	●	●	●	Sodium Alkylnaphthalene-Sulfonate
Tar and Grease Remover	DEWAXIT	●	●	●	●		●	Self-Emulsifiable Solvent Mixture
Tar and Grease Remover	NEUTRONYX 834	●	●	●	●		●	Polyalkylene Ether Condensate of Fatty Acids
Wetting and Rewetting Agent	PHI-O-SOL WA	●	●	●	●	●	●	Sodium Fatty Acid Ester Sulfate
Wetting and Rewetting Agent	SOROLENE G PASTE	●	●	●	●	●	●	Sodium Alkylnaphthalene-Sulfonate
Wetting Agent	NEUTRONYX 600	●	●	●	●	●	●	Aromatic Polyglycol Ether
Wetting Agent	N S A E PASTE	●	●	●				Sodium Alkylnaphthalenesulfonate
Wetting Agent	ESTRAMINE	●	●	●	●	●	●	Fatty Acid-Alkanolamine Condensate
Wetting Agent	XYNOMINE	●	●	●	●	●	●	Sodium-Amide Sulfate

GET THE LINE ON THE ONYX LINE
of better textile finishing agents

It requires the superior effectiveness, versatility and economy of these Onyx textile chemicals to get the most out of your dyeing, finishing and printing operations.

There is an Onyx product for almost every type of application, developed out of continuing research over the past decades. These Onyx finishing agents are the result of a close working relationship with the textile industry and have been created especially to meet the special and constantly changing requirements of the industry.

The skills acquired in the process are at the disposal of every textile finisher for the solution of any problem he may have. If you have such a problem, do not hesitate to call upon Onyx—there is no obligation.

THE RIGHT SPOT FOR BETTER TEXTILE FINISHING AGENTS

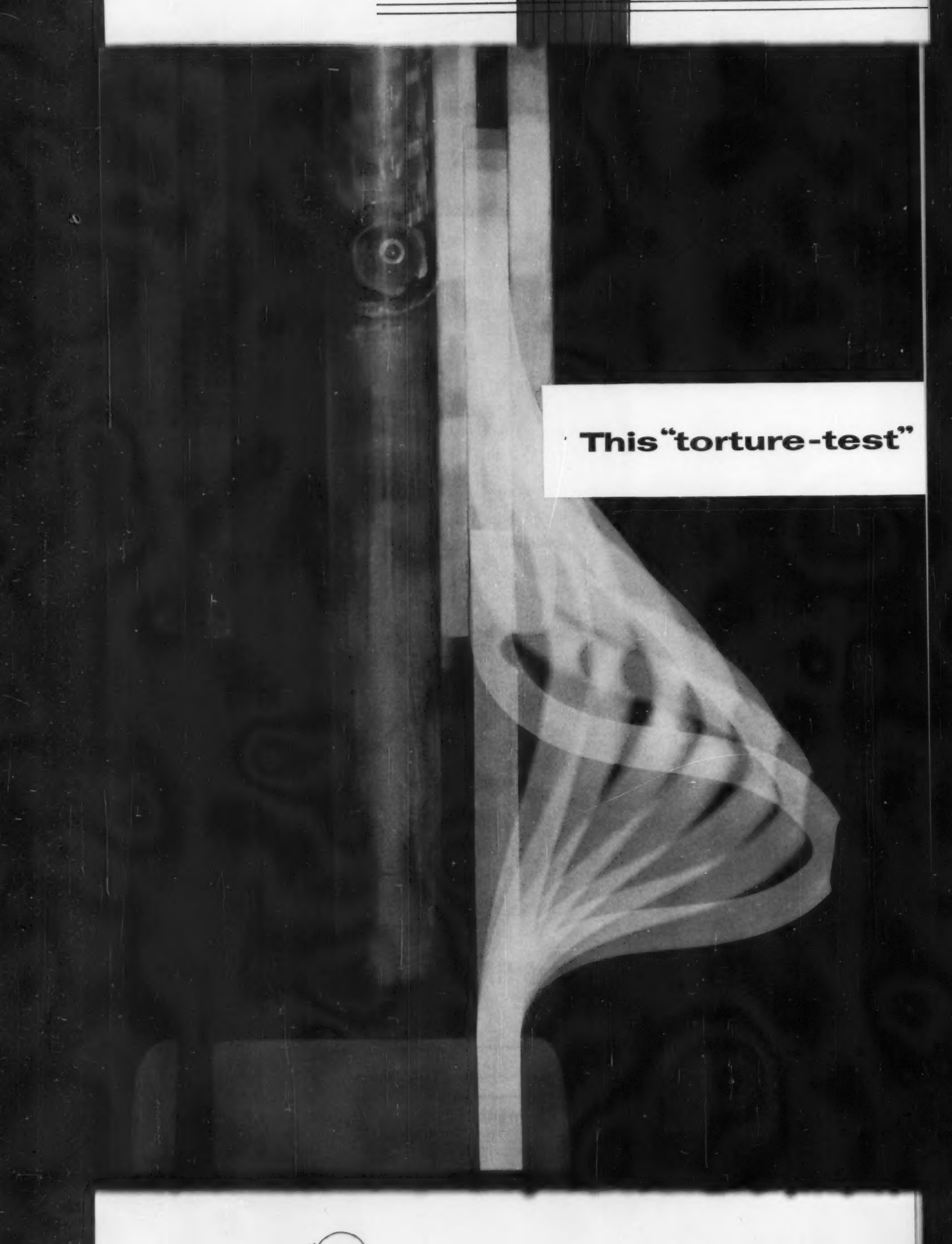
ONYX OIL & CHEMICAL COMPANY

TEXTILE DIVISION

WARREN & MORRIS STS., JERSEY CITY 2, N. J.
CHICAGO · BOSTON · CHARLOTTE · ATLANTA

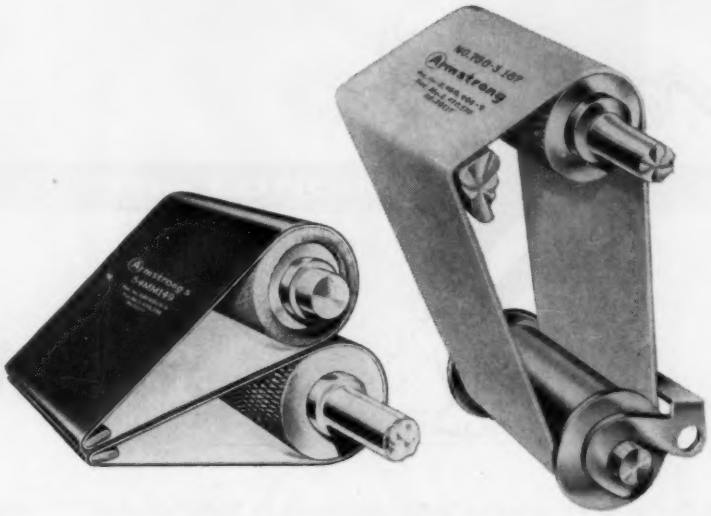
For Export: ONYX INTERNATIONAL, Jersey City 2, N. J. • *West Coast Representative:* E. S. BROWNING CO., San Francisco, Los Angeles

HERE'S THE FLEX-LIFE TESTER IN ACTION. On it, synthetic rubber


This "torture-test"

HERE'S THE FLEX-LIFE TESTER IN ACTION. On it, synthetic rubber compounds used in Accotex Aprons have taken over 4 million flexes without cracking—the equivalent of years of service!

This stroboscopic photo shows a single compound, with exposures at intervals of one ten-thousandth of a second. Notch visible at center of sample concentrates stress in small area.



helps Accotex Aprons give

LONGER SPINNING LIFE

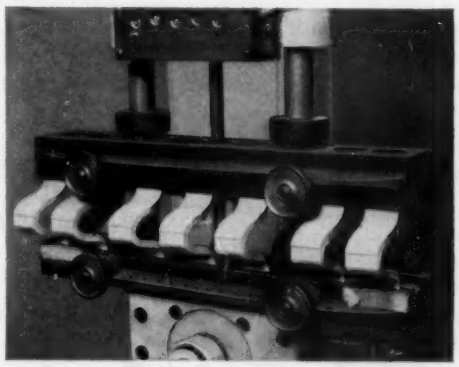
The split second stroboscopic photo at the left shows you how an Armstrong Flex-life Tester stretches and relaxes synthetic rubber compounds . . . *at more than 350 times a minute!* This unique machine helps Armstrong research engineers select the most durable synthetic rubber compounds for Accotex® Aprons.

Since the synthetic rubber compounds in this accelerated test are thicker than finished aprons, the bending strain is much greater. Just a few days of this flexing is equivalent to a lifetime of on-the-job operation. Only compounds that can stand up longest to this kind of punishment are chosen for use in Accotex Aprons.

This "torture-test" is one of the many exacting steps taken by Armstrong Textile Research Engineers to make sure Accotex Aprons give long, dependable spinning life on today's high-draft equipment. Other advanced testing methods, plus the latest production techniques, also assure you that these aprons will always deliver top-quality yarn.

If you're not already using these aprons, arrange for a test frame next time your Armstrong representative calls. *No matter what type of equipment you're using,* there's an Accotex Apron specially engineered for the job.

For the booklet, "Armstrong Textile Roll Coverings and Mill Supplies," write Armstrong Cork Company, Industrial Division, 6412 Dauphin Street, Lancaster, Penna.



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Textile SPRING-BEARD NEEDLES

Wire Products Division

TEXTILE MACHINE WORKS, READING, PENNA.

The LONG-RANGE VIEW

The Men Mills Lose

On page 8 of the October issue of TEXTILE WORLD we published a letter under the title "Why the Industry Loses Trained Young Men." Reaction to that letter has been of astonishing variety, ranging from "What does this guy want for nothing?" to some very thoughtful analyses of the problem voiced in that letter.

Regardless of what any individual may think of the letter, there seems to be evidence that the textile industry is being bypassed for more-promising industries. A few days ago a friend of ours who had been educated for the textile industry, spent some four years working in it, and then got out of it wrote us: "I've found the pastures greener outside the textile industry." A textile research director told us: "I can't hire a young chemist for the salary my company will pay." And we understand that some of the larger textile organizations that do hire college men are disturbed because they cannot attract the better students in non-textile engineering courses.

Reputation Earned and Unearned

Undoubtedly, some of this undesirable reputation is unearned. While it seems true that textile mills do not offer as high starting salaries as most other industries, there is some indication that after a three-year tenure the average graduate earns as much money in the textile industry as in other industries, and from three years on he earns more. There is also some indication that jobs are more stable in the textile industry than in other industries, judging by the number of job changes engineering graduates make in their first 10 years of working.

But we might as well face the unpleasant fact that part of the reputation is earned. Mills do make poorer offers than other industries. Mills do pay poor salaries to supervisors and engineers. Mills do let capable men get stymied by men of poor ability. Mills do forever talk starvation profits. Mills do block outsiders from the good jobs and save them for members of the family. Mills do commit thoughtless, sometimes cruel, human-relations acts. Mills do practice atrocious public relations.

Many of these things are limited to a relatively few mills; but still they occur, and they create a reputation for the industry that scares young, trained men away.

We understand that not only mills but also the textile schools are concerned about this problem of young men. Textile-school enrollment is down, while enrollment in other parts of the colleges is up. And there is some indication that textile courses need to be broadened, particularly as more large textile companies develop and there is room for men with training broader than processing techniques.

What Can Be Done

One letter we received from an educator in response to the letter we published in October proposed a five-point program for helping solve this problem of young men avoiding the industry. Because we personally know this educator and have high respect for his ability, experience, and sense of responsibility, we quote here his five-point program:

"1: A starting salary competitive with that of other industries. Many of us may think current starting salaries are too high; but if the textile industry is to get these boys, it has to compete on the basis of what is being paid, not what ought to be paid.

"2. Better utilization of college men. This means presenting them with a job that has a real challenge and giving them a clear understanding of what the opportunities for them are.

"3. Better-caliber students in the textile schools.

"4. Better curriculums in the textile schools—not just more facilities or a better staff, but a real education on things that will provide them with a basis for successful careers. In general, this would mean less processing and more Business Administration-type education.

"5. Better promotion aimed at presenting the textile industry in a better light to both high-school and college students and to their parents and instructors."

O. M. Thomas

STRETCHING

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The National Merit Scholarship Corporation

Business is Offered Big Dividends on Investment in Higher Education

The McGraw-Hill Publishing Company is availing itself of the opportunity to establish ten National Merit Scholarships. They will be known as the McGraw-Hill Merit Scholarships. The scholarships are to be awarded to qualified candidates for a four-year college course in the fields of science, engineering and the other professions and the liberal arts. There will be no limitation, beyond the appropriate professional accrediting, on the college or university selected by a successful candidate. As part of a continuing program to aid higher education and educational institutions, McGraw-Hill is happy to be able to share in what it believes to be the constructive educational endeavor of the National Merit Scholarship Corporation.

Business firms searching for a satisfactory avenue to provide financial aid for our colleges and universities now have a new opportunity of major importance. It is provided by the National Merit Scholarship Corporation, which has offered to devote $8 million to matching, dollar for dollar, gifts by business firms for college scholarships and supplemental gifts to the institutions where the scholarships are used.

The National Merit Scholarship Corporation, an independent agency financed initially by gifts of $20 million from the Ford Foundation and $500,000 from the Carnegie Corporation, has three major purposes which are closely related. They are:

1. To locate those of the nation's young men and young women who are best equipped to go to college.

2. When necessary, to help these young people go to college by giving them financial aid.

3. To help colleges and universities meet the full cost of the instruction of those to whom National Merit scholarships are granted.

At present about half of the nation's top high school graduates do not go to college. The principal reason is that they do not have the money required.

To Save Unused Brain Power

The National Merit Scholarship Corporation will strive to eliminate this dangerous neglect of top-flight ability. To this end it is inviting the nation's high schools, numbering more than 24,000, to participate in its program by designating as available candidates for National Merit scholarships the top 5 percent of their senior classes. Those so designated are then invited to take a series of tests and to submit reports designed to assure selection of the very best talent in each state. The number of scholarships to be allotted to each state will be proportionate to the number of high school graduates in the state.

The winners, the total number of whom will be determined by the amount of money the Scholarship Corporation has available, will be eligible for awards. For those who need no financial help to go to college there will be honorary awards of $100. For those who must have help the Corporation will grant scholarships covering as much as necessary

of the cost of instruction and living expenses for a four-year college course.

Colleges Get Financial Help

The provision of funds to cover the students' expenses does not, however, solve the financial problems faced by many colleges. That is because the tuition charges paid by the students do not cover the cost of the instruction. The deficit must be met by drawing upon endowment funds, gifts, grants, and other available sources.

Consequently, to prevent holders of National Merit scholarships from imposing any additional financial burden on the colleges and universities they elect to attend, the Corporation will make a supplementary grant to these institutions. The supplementary grant will be the equivalent of regular tuition charges made by the school, with a top limit of $1,500 a year for both the tuition and the supplement.

As the scholarship grants to the winning students will vary, depending upon how much financial help they need, so will the supplementary grants vary from one college to another, depending on their regular tuition charges. However, it is anticipated that on the average the full cost of a National Merit scholarship—including aid to the student and the supplement to the college—will be about $1,500 a year.

Many business firms will find a compelling appeal in a program which is designed at once to mobilize the nation's intellectual resources more effectively and, in the process, give very badly needed financial help to our colleges and universities.

Two For One Return Offered

However, there are numerous other inducements to business firms to finance National Merit scholarships. These scholarships may:

1. Carry the name of the firm or be named in honor of someone designated by the firm.
2. Be limited to use in types of colleges of particular interest to the sponsoring firm.
3. Be limited to a college course, such as science, engineering or liberal arts, of special concern to the sponsor.
4. Be restricted to candidates or institutions in geographic areas specified by the sponsor.

In addition to these advantages there is a special financial inducement to help the Merit Scholarship program. It is that for every Merit scholarship a firm or individual finances, the Corporation will, up to the limit of $8 million, match the funds and make another National Merit scholarship available.

There are many good ways of helping our financially beleaguered colleges and universities, and many corporations are already using one or more of them.* For those companies that can do so without embarrassing complications one of the best ways is to make unrestricted gifts directly to the institutions. But this new way provided by the creation of the National Merit Scholarship Corporation (Address: 1580 Sherman Avenue, Evanston, Illinois) has the broad appeal of serving two purposes of transcendent importance simultaneously. The purposes are to see that our best brains are fully trained and utilized and that our colleges and universities, crucial contributors to this process, are helped at the same time. Business will serve the nation and its own community well by giving the National Merit Scholarship Corporation generous help.

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* These, as well as the plight of our colleges and universities, are discussed in a pamphlet, "Business Aid to Our Colleges and Universities," which embodies a series of five editorials which appeared in all McGraw-Hill publications. Copies of the pamphlet can be obtained without charge by addressing the Department of Economics, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 36, New York.

Methods of helping our colleges and universities financially are also outlined and discussed in a pamphlet, "Aids to Corporate Support of Higher Education," which may be obtained without cost by addressing the Council for Financial Aid to Education, 6 East 45th Street, New York 17, New York.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

LEADERSHIP—
What Qualities Do You Need for It?

Leadership—whether top management or supervisory—requires certain qualities of mind and personality in addition to technical knowledge.

What are these qualities?

Can they be developed?

In this article, a textile man with years of management experience tells what he has found to be the most-necessary qualifications for textile-mill leadership.

By ANTONIO F. SCENNA

Many times top management men face the problem of selecting a new foreman. In general, most management men prefer to give an opportunity to some of the men already working for the company. In such cases, how should the selection be made?

It is well known that a man's personality may change considerably after he has been given some authority for the first time. Many times a good worker becomes a very poor foreman. How can you avoid the risk of promoting a man and later on, finding the selection was a mistake, not be able to demote him?

At other times, top management prefers to promote younger men recently out of school. The technical training of these men may be acceptable, but their personal qualifications are questionable. They have had no time to develop skill and understanding in working with people.

The same problems are faced when a present supervisor is promoted to a job with more responsibility, as a second hand to overseer, an overseer to assistant superintendent, etc. In this case, management has the advantage of having observed the supervisor in action; but still it is usually necessary to weigh one man's qualifications against those of another.

What yardsticks can be used in making the selection of a man for promotion? What qualifications are needed by any supervisor to become an industrial leader?

What Leadership Requires

The successful supervisor must meet two series of qualifications: technical know-how and personal qualities. One is not much good without the other.

The technical knowledge required varies with the particular supervisory job and the mill organization. In any situation, the necessary basic knowledge is easy to acquire by study and experience. Practically all the men management may consider for promotion have the required fundamental know-how. The yardstick for judging of technical promotability is therefore how well the future leader keeps himself advised on technological progress. Since progress is continuous, it is necessary that a leader continue to progress with the science and engineering in his field.

The personal qualifications required of a leader are so vital to success that they cannot be lacking under any circumstances. If either of the types of qualifications—technical know-how or personal qualifications—must be

amateur psychologist or, worse, a psychiatrist. All that

3. Job Ethics

missing, it could be technical knowledge but never personal qualities.

These personal qualifications may be divided into three principal aspects: aptitude, leadership, and job ethics. Every management man, consciously or unconsciously, by these descriptive words or others, weighs every man considered for promotion against these personal qualifications.

1. Aptitude for Leadership

Desire To Excel

Anyone who wants to achieve a better position or anyone who is not satisfied with being one more in the company or organization to which he belongs must have or create within himself a decided and frank desire to excel. He must have confidence in himself and confidence that he will be promoted and will prove successful. He must repeat to himself again and again that whatever position he may assume, no matter how humble, he will and must always be the best.

This desire must be created and firmly developed, even though it entails fighting against comfort, conformity, sloth, skepticism, lack of interest, or carelessness. It should be implacable—a frank, loyal, understanding desire for excelling every day and every hour.

The desire to excel is not the same as ambition. To excel is to fill the need for acquiring knowledge, perfecting what one already knows, polishing one's personality, educating one's character—in short, making personal progress.

Ambition

Ambition, within fair limits, is also a virtue that should not be lacking in the personality of the aspirant, since to be indolent, routine, lacking any ambition is as bad as being a selfish person whose unlimited ambition impels him to accept any path, honest or not, for achieving a goal never completely satisfied. Ambition therefore may adorn the personality of the manager so long as it is within just limits and mixed with part of his desire to excel.

Responsibility

An important virtue that should not be lacking is the feeling of responsibility. Responsibility is the aptitude that leads him to carry out his daily duties, to achieve prestige, and to create conditions of personal trustworthiness.

Nothing disappoints a superior more than to realize that a man selected to fill a higher position lacks a sense of responsibility. Nothing arouses more good will than an interest shown in fulfillment of one's duty.

Capacity for Work

Dedication to work is another important virtue closely associated with responsibility. Dedication to work means cheerfully carrying out the necessary tasks. It involves giving the tasks all possible attention, without becoming distracted or distracting fellow workers, and learning how to carry out a job in the least possible time.

To show dedication is always to do a little more than duty may strictly demand. It even involves such small details as always being punctual in coming to work and a willingness to stay on the job until the work is finished. These details are minor, almost insignificant; but they reveal part of a man's character and fitness for promotion.

It would be well at this point to emphasize sincerity. Dedication to work is not the same as obsequiousness ["apple-polishing"]. What the aspiring leader needs is a sincere interest in the job entrusted to him and a sincere identification of his own interests with the company's interests.

These aptitudes must be accompanied by an observant spirit, correct conduct, adequate vocabulary, and neat appearance.

2. Leadership

Leadership is nothing more nor less than successfully dealing with people. Unfortunately, this technique is not taught in primary schools or technical institutes.

We will try here to make an analysis of the leadership qualifications a future manager must possess.

Fundamental points a leader should keep in mind in dealing with people are: first, nobody blames himself; second, we all overestimate ourselves; and third, a leader must continually try to understand people.

Nobody Blames Himself

No matter how grave or trifling the fault may be, no matter how many times someone assures you that "It was my fault," nobody really and sincerely blames himself for anything. When you deal with people, you are not dealing with someone who may judge their own acts impartially; you are dealing with creatures full of prejudice and driven by pride, ambition, and vanity. Therefore, when you have to call a subordinate to attention, remember that he will not take blame and most probably will be resentful.

Everybody Overestimates Himself

In the second place, remember that in dealing with workers, other supervisors, and our boss, each one of us overestimates himself. Call it what we may—self-esteem, pride, vanity—it is the feeling of being important.

The desire to be an important person is an infallible human aim that is persistent and tenacious. No one can escape it; therefore we cannot forget it in dealing with other people, no matter how humble or important the job may be. In any situation, the other person's feeling of self-importance will be present and latent, and only by knowing how to respect and encourage that human anxiety can a leader make such a man behave in the way the leader knows he should.

People like being appreciated and wish to do something outstanding. Encouragement leads them to improve themselves and make a greater effort to increase their superior's and their group's appreciation. An important yardstick for judging promotability, therefore, is whether the aspiring leader has a sincere desire to build people up or an ingrained habit of tearing them down.

Understand People

Fundamental technique in dealing with people requires that the leader must try always to interpret how the mind of the person he is dealing with operates. In order to understand the acts of his subordinates, nothing serves better than to place himself in their place and try to see things from their points of view. To understand people, it is necessary to make an effort to imagine how these other brains reason, why these other people do things this way, why they adopt certain attitudes, why they conduct themselves in a certain way, etc.

This skill, of course, is the most difficult of all to attain. It is the skill in which the young man well trained technically fails most often and most seriously. It is also the skill in which less-educated men who came up through the mill, acquiring technical knowledge and experience but not succeeding in disciplining their minds, prejudices, and selfishness, also fail most often and most seriously.

The aspiring leader should by no means try to become

an amateur psychologist or, worse, a psychiatrist. All that is needed is a habit of mind and personality to try sincerely to understand and appreciate the other fellow's point of view. The only end result sought is to work together effectively and in harmony.

Firmness of Character

Although these three points are fundamental in developing leadership, they are not the only qualities of leadership the aspirant should have. Another important one is firmness of character. One who gives orders must necessarily be decisive and logical in his orders, clear in his instructions and aims, and consistent in his habits of character. It is advisable to think for a moment before giving an order, since the leader cannot appear undecided or vacillating. Once a solution is adopted, he must be firm and final.

Firmness of character does not mean a dictatorial temperament. Far from it. Workers do not like a boss who is too energetic about showing his authority. On the contrary, firmness of character means a temperate character with self-assurance. It involves the ability to face facts, accidents, or people calmly, without fear or worry. It involves the courage to handle the unruly subordinate or the eternal rebel who wants to satisfy his desire for self-importance by trying to dominate. It also involves the self-denial of subjecting your own inclinations to the good of the group and the operation.

Enthusiasm

Another aspect of leadership our aspirant to industrial management should have is an enthusiastic temperament. Contagious enthusiasm drags fellow workers and subordinates with it, giving a spirit of adventure and accomplishment to routine tasks. In achieving these purposes, the leader must stress the importance of the work being done, the high aims pursued, how a bad job becomes an obstacle to the subsequent task, etc.

People are not interested in what they don't know; therefore, for obtaining interest and enthusiasm from his employees, the leader must explain to them the work techniques, the task involved, the operation, why the machine has such and such devices, etc. In short, it is necessary to make them interested in what they are doing every day to avoid the dullness of routine. The mark of leadership is to be able to instill enthusiasm in this way without giving the impression of teaching.

Respect for Authority

A last point in this brief analysis of leadership is the need of knowing how to inspire authority.

Authority may be imposed by fear of punishment or by special circumstances, but these means are not at all advisable. A well-understood and effective authority is inspired, not imposed.

To inspire authority, it is necessary to have adequate ability and capacity. Nothing wins the respect of a subordinate more than the knowledge that his boss knows how to do his daily tasks. The leader cannot lie to a subordinate; the subordinate easily finds out if his boss knows or not; and if he realizes that his boss doesn't know his job or cannot give a convincing explanation when asked something, he will lose his esteem for him. Therefore, for inspiring authority, it is necessary to make yourself capable by studying, observing, and concentrating.

The basic aspects of leadership outlined are personal qualities and habits a future industrial manager must possess to achieve success. The aspirant should remember always that character is produced by habits and customs and can and should be remade to further his desire of becoming a leader.

3. Job Ethics

Under this heading we have grouped several responsibilities that complement the personal qualifications a good industrial manager must meet. For analyzing them, we have divided them as follows: (1) to defend the company's property, (2) to be alert to the company's prosperity, and (3) to be loyal to the company.

Defend the Property

The company that has contracted for the services of a worker, no matter what position he assumes in the company, expects to derive a benefit from his work. For this purpose, the company puts in his hands machines or men from whose work the amount paid him plus a profit must be obtained. The employee, and to a greater extent the managers, must accept this arrangement and collaborate for achieving this purpose. Therefore, it is the responsibility of each employee, and again particularly of the leader, to work with the greatest efficiency possible and at the greatest possible saving in materials and energy.

Be Alert to Company's Interests

The cost and quality both of the article produced and of the administrative activities are constantly changing. New developments for obtaining greater benefits and better quality are constantly being made.

The industrial manager at any level should have an agile mentality and a studious and observant spirit constantly alert for these advances. This habit is nothing more than working toward the prosperity of the company by which he is employed. In turn, this habit is a means of indirectly working for his own prosperity.

Often, this part of the leader's function causes a feeling of frustration, resentment, and neglect. The tendency of younger men is to try to make sweeping change. Usually, such drastic measures are based on sudden inspiration sparked mainly by the young man's desire to make his mark on the organization and win quick recognition and possibly further promotion. When his suggestion is turned down, he often regards it as a personal defeat and rationalizes it by branding the company and his superiors as too bound by tradition to progress.

The man with more experience with the company often has a tendency to let well enough alone. Rather than run the risk of having a suggestion he made declined or tried and fail, he carries out his routine tasks and leaves improvement to his superiors.

In either case, the aspiring leader is developing habits that will severely limit his leadership and therefore his success.

Loyalty to the Company

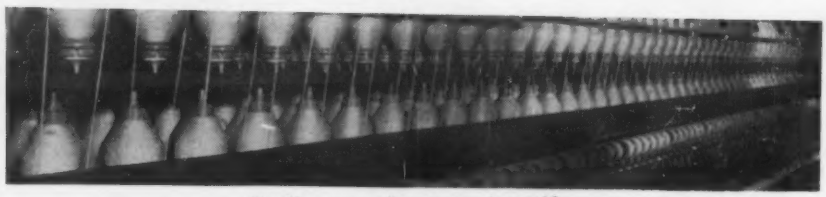
One who aspires to higher or more important positions, who wishes to scale the upper levels in his organization, must always remain loyal to his company.

Loyalty should not be directed toward some person in particular but to the company, the personnel of the organization, and the operation of the company as a whole. It is as unethical to be guilty of misplaced loyalty as to be downright disloyal.

Conclusion

There are practically no limits to the traits of character, personality, and techniques that could appropriately be discussed in an article on leadership. However, the ones discussed here are the result of management experience in textile-mill work. We are sure that any aspiring leader who possesses these qualifications and develops the character traits and human-relations skills outlined will be a successful leader.

Weekly Cleaning Costs in Our Best Mill

1948 $2,210.95		1955 $1,201.51	Weekly Savings $1,009.44
$19.20	Overhead	$19.20	—
576.40	Creels	54.96	$521.44
			
870.55	Roll stands to pigtails	707.35	163.20
504.80	Pigtails to floor	180.00	324.80
240.00	Floor	240.00	—

THIS PICTOGRAPH was used in 1948 to show us where to look and work for savings in cleaning. Before making the chart, we didn't know where we were spending our cleaning dollars. The three columns of figures, left to right, show the 1948 costs, the 1955 costs, and the weekly savings. The top figure ($19.20) represents week-end overhead cleaning costs that have not changed.

Saved— $50,000 a Year on CLEANING

This mill took a look at its spinning-room cleaning costs and shuddered. The waste cost more to clean up than salable yarn cost to produce.

A plan was set up to test the amount of cleaning actually needed. The overseers had to be sold on the idea; but when they saw what could be done, skepticism vanished. Here is a mill man's report on a program that resulted in—

- **Weekly savings of more than $1,000**
- **Some cleaning frequencies extended 500%**

Step 1—We Looked at Our Cleaning Costs

We just got a $1,700-a-week cleaning bill from one of our spinning rooms; it costs us that much just to keep the frames and floors clean. That's what we pay for manual cleaning now, without figuring on possible higher wages in the future.

So, we're taking a long look at that bill. We're stacking it up against another bill we got for spinning-room cleaning. This last bill is from our most modern plant.

For example, we see by the pictograph that our most modern plant spent $2,210.95 a week in 1948 for manual cleaning. . We spend $1,201.51 a week now in that plant. The savings from our seven-year program amount to $1,009.44 a week, and the program is still incomplete.

Looking at the comparative cleaning costs of four plants, we see that three of our other spinning rooms are not doing so well. Employees in these

tribution of fly in spinning rooms— no yarn had to be segregated for test other cleaning. At that time, the

Weekly Cleaning Costs in Our Best Mill

1948		1955	
Full-time cleaners			
33 roll pickers	$1,055.60	11.5 roll pickers	$352.16
11 sweepers	330.00	11 sweepers	330.00
4 steel-roll cleaners	128.00	4 steel-roll cleaners	128.00
		3 sweeper-cleaners	90.00
Part-time cleaners			
6 doffers	288.00		
6.4 spinners	282.15	6.4 spinners	282.15
2 section men	108.00		
0.33 week-end cleaners	19.20	0.33 week-end cleaners	19.20
Total	**$2,210.95**		**$1,201.51**

OUR BEST MILL in 1948 had the equivalent of 62.7 operators on cleaning jobs in the spinning room. This help amounted to 1.6 operators per thousand spindles on coarse carded yarns. Spinning-room cleaning then cost $2,210.95 a week in that mill.

The same mill today has the equivalent of 36.2 operators on cleaning jobs in the spinning room. This help amounts to 0.9 operator per thousand spindles. The cost is $1,201.51 weekly—over $1,000 less than in 1948.

Weekly Cleaning Costs in Our Four Mills

	Hours of cleaning	Dollar cost	Estimated future saving
Mill 1 (our best mill)	1,441.2	$1,201.51	.....
Mill 2	1,660.0	1,490.00	$300
Mill 3	1,705.0	1,688.55	450
Mill 4	1,801.0	1,733.25	450

MILL-BY-MILL ANALYSIS of spinning-room cleaning shows that our present job is to extend what we learned in the first mill to all the other mills, two of which have just recently been added to our management group. The costs shown here have been adjusted as nearly as possible to comparable yarn numbers, spindles, and production.

rooms need to know what we do in our best mill. Our present job is to extend that 1948-55 program to all our other plants. This report may be called a master plan for savings in spinning-room cleaning, based upon what was done in the first mill.

Three Ideas for Saving

Our program for the first mill stressed three main ideas for saving money on cleaning:

1. Keep a dollar chart of where the cleaning dollar is being spent. The pictograph, for example, shows us the amount of money we are spending for cleaning the various parts of the spinning frames. It shows us where to work for savings.
2. Know when we're getting enough cleaning.
3. Know how to test for the proper frequency of cleaning.

Mechanized cleaning is not in this list of fundamentals because its advantages are obvious and well understood. We have much of this equipment in our spinning rooms. But we have found that the problem of managing cleaning is the same, whether you have the latest equipment or not. Good management requires the full facts on where the cleaning dollar is spent, a good test to determine how often to clean, and information on how much cleaning is needed.

With complete information, a mill can manage its cleaning wisely. It can get the full potential savings from any type of mechanized cleaning. Without this information, the mill may not be able to capitalize fully on the potential savings now being offered. Seven years ago, we didn't have the full facts on our cleaning. Here's how we got started:

Why Cleaning Tests?

When we started to analyze cleaning, some supervisors wanted to know why tests were necessary. Tests were needed in our mill because we hadn't changed cleaning schedules in over 10 years. We hadn't even examined them closely. The dates on some schedules posted in the spinning alleys were pre-Pearl Harbor.

While we had not changed our cleaning schedules, we had changed our stock several times. We had changed cotton, blends, roving, drafts, numbers, fabrics, and some machinery. Even our help had changed. But spinning-room cleaning—a $2,210.95-a-week business at that time—had not been tested.

We explained to the supervisors that our mill was spending over $2,000 a week for the removal of a few hundred pounds of lint and fly from spinning frames. On a pound basis, this amount was more than we spent for good yarn going into salable fabric.

When spinning-room cleaning was presented in this light, we got some interest from supervisors, and we got good cooperation as we worked out the details of how often to clean.

Step 2—We Made a Cleaning-Frequency Test

The next problem was to test the frequency of cleaning so that we would know how often we should wipe the creels, backs, and other parts of the frame for our particular quality of yarn.

Our spinning-room overseer came up with a good idea for testing frequency. The idea that he proposed was to clean a test frame thoroughly and let it run until it needed another cleaning. The elapsed time would be the frequency of cleaning required.

But this method did not work well because of the personal-judgment factor. Second hands disagreed on how clean a frame was. When they did agree, they often recommended schedules that had bad effects on spooling, warping, slashing, or weaving. We had to find another method, and we had to incorporate quality data from later processes so that we would have the full picture on any proposed changes in schedule.

How the Test Was Planned

Here are the steps we took in making our tests:

1. For test purposes, the overseer of spinning was named the sole judge of how clean a frame was.
2. To back up the overseer's personal judgment and at his request, we borrowed a technique used by oil manufacturers for studying the dis-

Weekly Labor Cost for Spinning-Room Cleaning—1948

tribution of fly in spinning rooms—the lint-adhesive test. To perform this test, we obtained the weight of fly distributed at important locations on the spinning frame. We now had actual measurements to back up the overseer's judgment of how clean the various locations were after specified periods of operation. However, the overseer's judgment was still the principal factor in determining cleaning frequency.

3. Copies were obtained of regular mill reports on spinning-ends down, loom stops, loom efficiency, and loom seconds. Special checks were planned for tailings at the spooler to show up gouts and imperfections.

How the Test Was Conducted

We isolated a block of warp-spinning frames on the same yarn number. The fabric made from this yarn was average quality so far as customer demands were concerned. The principal reason for selecting this yarn was that we had only 12 frames producing it. It was easy to follow up this production at later processes, and no yarn had to be segregated for test purposes.

We had these frames cleaned from top to bottom to the overseer's satisfaction by a special week-end crew of cleaners. All parts were cleaned from the top creel to underframe components, including top rolls, steel rolls and clearers. Every manual-cleaning operation was carried out on these frames so that we had a sound basis for determining how long the frames should run before recleaning.

Adhesive Placed on Frames

Strips of adhesive 4x6 ins. in size were placed on the frames at certain locations for the lint-adhesive test. We found that we had to limit the use of this test to the flat surfaces of the frame. Of the 12 frames tested, only two frames were equipped for the test. To determine fly distribution in the creels and on the backs, we weighed each strip of adhesive and placed three strips at different locations in the creel.

The 12 frames were run until the overseer decided that they needed another cleaning. At that time, the adhesive strips were pulled and weighed. The overseer made his personal inspection and entered his findings on a special inspection form that showed the hours run for the various frame locations being checked. Then the overseer made recommendations for cleaning frequency for each location.

The weights from the lint-adhesive test were recorded, along with copies of the overseer's inspection report. We found these weights valuable as a check against later tests and also as reference data for future problems in managing our cleaning schedules.

Information from later processes showed how the yarn ran on the spooler and looms. From all these data and with the help of the standards and laboratory departments, the overseer decided how long the frames should be allowed to run before recleaning. This decision was made for every component of the frame, from creels to underframe parts. These decisions resulted in a saving of $1,000 per week for our best mill.

Step 3—We Added Up Our Savings

As a result of testing and recording, we have extended the frequency of cleaning spinning-frame creels from 8 hrs. to 120 hrs. To begin with, we were cleaning creels once each shift, just as many other mills were doing on coarse carded yarns. At that time, we had our original traveling cleaning equipment, which of course was not as effective in directional coverage or air volume as the latest models of the same equipment. Yet, our tests showed that even on frames with old cleaning equipment we could safely extend the frequency of wiping these creels from 8 to 24 hrs. and reduce our cost by two-thirds.

On frames equipped with the latest cleaning equipment, our tests showed that this frequency could be extended from 8 to 120 hrs. In other words, where seven years ago we wiped these creels once every 8 hrs., we now clean them every 120 operating hours. It cost us $224.40 a week to clean top creels in 1948; now we pay $14.40 a week to wipe these creels. We paid $288 a week to wipe bottom creels in 1948; we now pay $19.20 a week. For both creels, the saving is $478.80 weekly.

Less Lint in Creels

Our seven-year program also gives us an interesting sidelight on spinning-room cleaning. We have kept our records of weights recorded for the fly-adhesive tests. From these records, we know that we have less lint in the creels after 120 hrs. of operation and with a 120-hr. cleaning frequency than we had in 1948 after a 24-hr. run. This improvement can be traced to the vastly improved traveling cleaners. Nevertheless, without our convincing tests we never would have been able to change the cleaning frequency from 24 hrs. to 120 hrs.

We extended the cleaning of backs and roller beams from 8 to 24 hrs., which reduced this cleaning two-thirds. We extended picking flat top clearers from four times per shift to three times per shift. This change resulted in a cleaning frequency of 2.7 hrs. The savings on backs and top clearers amounted to $163.20 weekly.

The cleaning frequency for top rolls and steel rolls was not changed. We could extend the wiping of roving rods only to once every 24 hrs. because the roving tags had to be removed periodically.

Sweepers continued on the same schedule; change affected the methods rather than the frequency. Formerly, we had some cleaning operations performed by doffers and section men, such as cleaning frame ends and blowing off frames. The best help among the sweepers was trained to do these jobs. More savings were made because the lower-rated help was able to do these jobs adequately. Sweeping and cleaning underframe parts originally required 783.5 hrs.; we reduced this time to 560 hrs. The dollar cost changed from $744.80 to $420, a reduction of $324.80.

Over $1,000 per Week Saved

The total savings amounted to $1,009.44 per week for the seven-year period in the first mill. We expect to do as well in the other mills. However, we also expect to continue to save in the first mill because our data on cleaning costs and frequency enable us to take advantage quickly of advances in cleaning techniques. We also expect to use some older techniques that we have not yet been in position to exploit.

While this report primarily concerns the dollars-and-cents return from one management's study of spinning-room cleaning, it should also point up the intangible value obtained from the program. This intangible value was largely educational and psychological.

The effect of going the full mile in building up a story of our cleaning needs was important to our supervisors and employees. The program showed that we considered manual cleaning a serious business and that we meant to improve it and get as good control as possible over it. The job of selling supervisors and em-

Weekly Labor Cost for Spinning-Room Cleaning—1948

Operator	Job	Time required (minutes)	Frequency (hours)	Total hours per 120-hr. week	Cost per 120-hr. week
Roll picker	Pick top clearers	1	2	175.5	$140.40
	Pick top rolls	12	24	160	128.40
	Wipe backs	6	8	240	192.00
	Wipe top creel	7	8	280.5	224.40
	Wipe bottom creel	9	8	360	288.00
	Wipe roving rods	2	8	80	64.00
	Miscellaneous cleaning	..	..	23.5	18.80
Drill cleaner	Clean steel rolls	..	..	160	128.00
Sweeper	Sweep	..	..	320	240.00
	Mop and clean underframe	..	..	120	90.00
Doffer	Mop frame ends	3	8	120	144.00
	Mop rockers	3	8	120	144.00
Spinner	Run out guides	..	..	160.5	176.55
	Strip bottom clearers	..	..	96	105.60
Section man	Blow off frames	..	..	80	108.00
Week-end cleaner	Blow down overhead	..	..	24	19.20
Totals				2,520.0	$2,210.95

THIS CLEANING SCHEDULE was used by our best spinning room in 1948. The chart shows in detail the time required for each cleaning job, the frequency, the hours of work involved per 120-hr. week, and the labor cost per week based on wages of 80¢ per hour.

The formula used for obtaining the hours of work is:

$$\frac{\text{minutes per frame x 120 hrs. x number of frames cleaned}}{\text{frequency x 60 mins.}} = \text{hours per week}$$

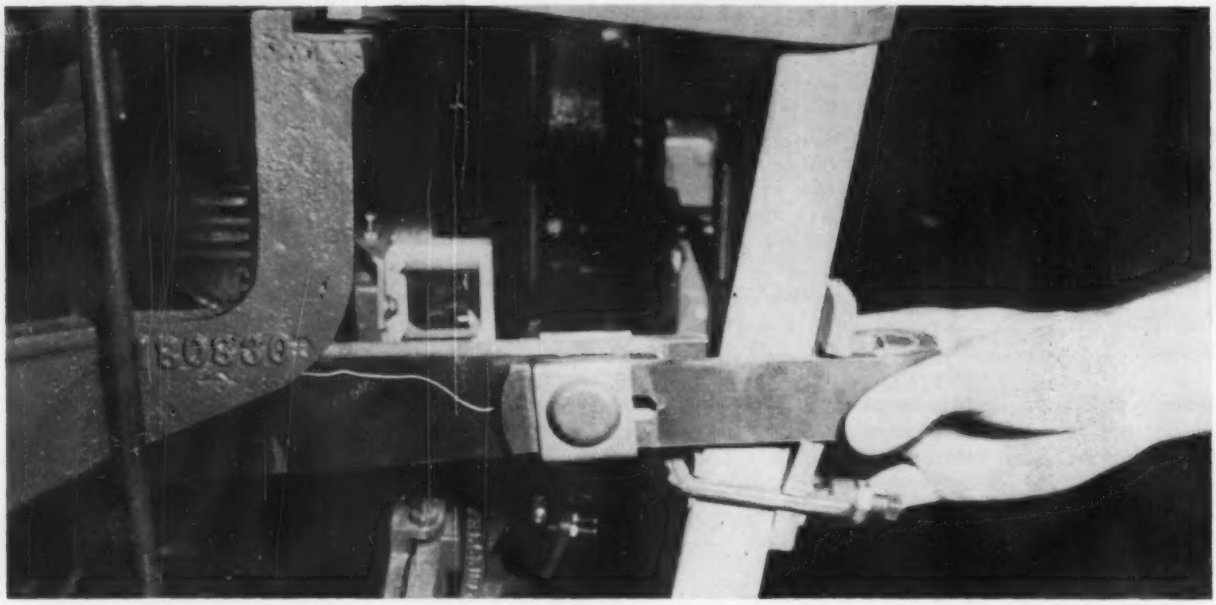
Weekly Labor Cost for Spinning-Room Cleaning—1955

Operator	Job	Time required (minutes)	Frequency (hours)	Total hours per 120-hr. week	Cost per 120-hr. week
Roll picker	Pick top clearers	1	2.7	132	$105.60
	Pick top rolls	12	24	160	128.00
	Wipe backs	6	24	79.5	63.60
	Wipe top creel	7	120	18	14.40
	Wipe bottom creel	9	120	24	19.20
	Wipe roving rods	2	24	26.7	21.36
Drill cleane	Clean steel rolls	..	....	160	128.00
Sweeper	Sweep	..	....	320	240.00
	Mop and clean underframe	..	....	120	90.00
	Blow off frames	..	....	120	90.00
Spinner	Run out guides	..	....	160.5	176.55
	Strip bottom clearers	..	....	96	105.60
Week-end cleaner	Blow down overhead	..	....	24	19.20
Totals				1,440.7	$1,201.51

A REVISED CLEANING SCHEDULE is now in effect in our best spinning room. Formula for calculating hours of work is the same as that used in 1948. Many cleaning operations were eliminated, and cost was greatly reduced. Quality of our yarn is better than ever.

ployees was made easier because the facts from the tests were convincing to all.

The program therefore served two purposes for our mills: It gave us the answer to how much cleaning we really needed and helped us eliminate useless work, and it provided our other mills with tools that we hope to use in the future for other savings as manual cleaning in spinning becomes less and less of a major cost factor.



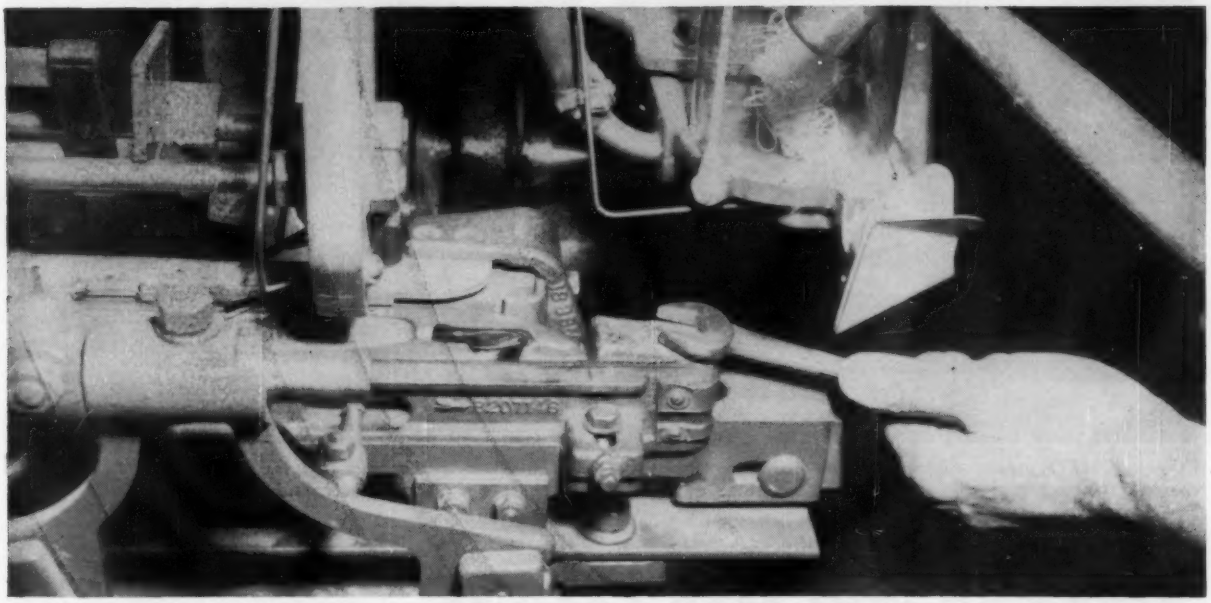
SHUTTLES will box correctly if all parallel-motion and related parts are free from binding. Here, the loomfixer checks the sweep stick and lug strap for binding before he starts to parallel the picker.

How To Parallel PICKERS On C&K S-6 Looms

- Production men running S-6 looms bogged down with low production and high seconds can often eliminate many of their problems and get their looms to running again by simply paralleling their pickers closely.
- Here's how—

By W. R. CALLAWAY

PARALLELING the picker to the shuttle at the front as shown here is only half the paralleling job. It's equally important to parallel the picker at the back. At the front, the shuttle is raised $\frac{3}{32}$ to $\frac{1}{8}$ in.



PICKER is driven on the picker stick carefully so that no burrs to damage the filling yarn are left on the picker or stick. The picker is driven down several times and checked at each stage for being parallel.

PARALLELING THE PICKER on the drive end of Crompton & Knowles S-6 looms consists of only a series of little adjustments. But making and keeping those adjustments right makes a big difference in weaving a fabric.

Pickers out of parallel cause three major troubles that cut into loom production:

1. Broken warp ends
2. Broken filling
3. Bang-offs

Many loomfixers don't know how to parallel pickers. They often parallel the picker closely at the end of the picker-stick stroke (front) but do not parallel it at the lay-end position (back). However, the back position is just as important as the front.

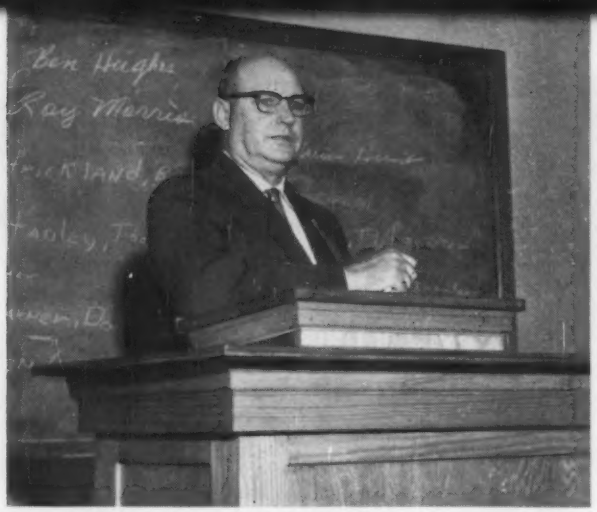
Until a loomfixer learns to parallel a picker, he should remove the box front and the binder from the loom so that he can easily see if the picker is parallel at both the back and front. While the binder and box front are out, check the shuttle box plate to see that it is aligned with the lay before attempting to parallel the picker.

Remove the picker stick from the picker-stick shoe. Check the condition of the rocker iron, picker-stick shoe, picker-stick tongue, stud and roll in the rocker iron, and heel bolt. Never weld any of these parts because it's difficult or even impossible to parallel a picker when the rocker-iron parts are welded.

When the picker stick is bolted in the picker-stick shoe, be sure the stick can be moved up and down ⅛ in. with the picker stick against the back

CONTINUED ON PAGE 153

SCREW to hold the picker to the picker stick should be put in at the back. A screw in the front side of the picker will bruise or break the filling. A screw in the back side damages the binder.



HOMER ROBERTS, general chairman of TOE, of Geneva, Ala., was in charge of the meeting.

BRUCE GRAY, of Langdale, led the discussion in the session on mechanical and electrical problems.

Alabama Mill Men Look to Savings on SUPPLY COSTS

• Reports from the fall meeting of the Alabama Textile Operating Executives at Auburn, Ala., show that mills have a large investment in spare parts in their supply rooms. Here's what they are doing to protect that investment.

MEN FROM 13 ALABAMA MILLS got down to brass tacks in showing ways to protect their supply-cost investments. The mills involved in the meeting have 700,000 spindles. Figuring supply stocks at only $1.50 per spindle, the mills have over $1-million tied up in spinning supplies alone. But some mills keep a supply stock of $3.50 per spindle.

The normal supply inventory in a mill running twills and drills is $3.50 per spindle and $140 per loom. At a print-cloth mill the inventory is $1.50 per spindle. Loom supplies at a mill running ducks are $150 per loom; spindle inventory is $3 per spindle.

Men from 7 of 12 mills reporting on the control of supply costs showed their concern for supply costs by letting only overseers and second hands write supply requisitions. In the other five mills, two mills let head loom-fixers write orders and three let section men write their own orders.

Require Old Parts for New

Seven mills require old parts to be turned in to the supply room before new parts are issued. Two other mills have systems that require inspecting parts removed from looms. And only one mill reporting did not check throw-away parts.

The answer of one mill on its method of handling broken parts is typical of other answers: "Broken parts removed from all machines are taken to the supply room. If the parts can be reused, they are welded or repaired. If repairing is not practical, they are thrown on the scrap pile. This way, we do not have a lot of parts that cannot be used in the supply room."

Take Inventory Often

Mills are also keeping a close check on supplies by taking complete inventories of supplies often. The time varies from three months to one year. Mills using the perpetual-inventory system also take inventory. The frequency of the inventory check varies from counting the parts in a few bins each day to complete inventory once a year.

Most mills are watching their inventory turnover. The complete turnover ranges from every 2½ months to 2.7 times a year on a dollar volume. Representative answers by mills are:

Mill A—"We check our inventory twice a year, the first of Jan. and the first of July. The July inventory is only a physical check to see if the book inventory has a great discrepancy. With this practice, adjustments can be made so that discrepancies will not come at the end of the year when we are closing the books.

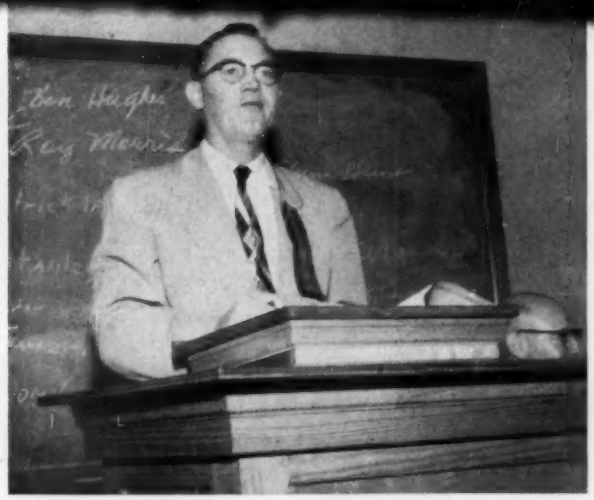
"We have used our present system a long time and seldom have a large discrepancy.

"Our inventory may be a little high for the number of looms in our mill, but we have found that it is better to have our inventory a little too big than to have machines stopped for the lack of parts. However, we have lowered our inventory costs the last few years. But with rising costs, any inventory a mill has is a pretty good investment."

Mill B—"Our supply inventory turnover varies with these conditions: (1) volume buying to take advantage of quantity prices, (2) machinery changes, (3) large stock as a result of slow delivery, and (4) overhauling periods when more than a normal supply of replacement parts are needed."

Mills Salvage Loom Parts

Eleven mills are salvaging loom parts by welding them. Among the parts salvaged are shipper handles, box fronts, clutch levers, gear guards, filling feelers, cloth-roll stands, back box-plate extensions, etc. But the parts to be welded are carefully selected. First, costs are checked to



LESTER SAYER, of Opp, kept the supply session going. He was also elected executive committeeman.

CLEVELAND L. ADAMS, of Auburn, secretary of TOE, made the survey for the questions to be discussed.

be sure the welding operation doesn't cost more than a new part.

One person in each mill is responsible for determining whether parts are to be welded or scrapped. The person who makes the decision varies from mill to mill. In one mill, it's the head loomfixer; in another, it's the weave-room overseer; and the master mechanic makes the decision at a third mill.

Along with ways to repair broken parts, mills are interested in what causes parts to break and ways to prevent the breakage. When a given loom part is breaking excessively, loomfixers check the loom settings on the parts that could cause the breakage. On some broken parts, the part is reinforced at the point of breakage.

Metallize or Weld—Which?

Most mills prefer building up journals and shafts with an electric welding torch to setting up metallizing equipment to do the job. On larger jobs such as card feed rolls, metallizing is often used. But some mills report excellent results in metallizing small shafts such as shafts for motor rotors where heat from welding causes the shaft to warp.

Most mills reporting follow this rule: Don't metallize when (1) there's a keyway, (2) the shaft is threaded, and (3) setscrews contact the metallized surface.

Typical comments by mills on welding and metallizing are:

Mill A—"We salvage a lot of loom parts, but we salvage only those that can be repaired cheaper than we can buy new ones. However, if we're out of a given part in the supply room, we weld the broken part so that we can get the machine back in production as soon as possible."

Mill B—"The job to be done determines whether we weld or metallize a part. We use an electric welder more than our metallizer."

Mill C—"We keep our metallizer set up all the time. Then we have only to light the metallizer and chuck the part to be metallized."

Mill D—"We don't metallize friction-bearing surfaces or any other place where a casting has to be press-fit such as crankshafts and camshafts on looms."

Oiling To Avoid Breakdowns

Lubricating practices to keep down breakdowns was another subject discussed. In most mills, each production department is responsible for oiling its own machines; but the maintenance department lubricates line shafts and electric motors.

However, maintenance men in a few mills are interested in lubricating production machines. Methods reported by mills are:

Mill A—"We make weekly inspections of all bearings and shafts on machinery all through the mill. Then we report conditions to the department overseer and the mill superintendent."

Mill B—"We check production machines and call any lubrication trouble to the attention of the head of each department. The overseer usually has the trouble corrected."

Mill C—"We provide each department with the proper oiling equipment and see that regular oiling schedules are maintained."

Mill D—"We examine parts sent to the shop for repairs and check production machines to determine oiling practices."

Mill E—"We have a centralized lubrication department that is responsible for oiling and greasing all machinery except electric motors. Each oiler is given specific duties. He has a written schedule to go by. All machinery is set up on a definite lubrication schedule, and this schedule is followed closely.

"We also use centralized lubrication systems and antifriction bearings everywhere possible. Only the highest grade oils and greases are used. Antirust and antioxidation additives are used where they are beneficial. A Kardex record file is kept on all lubrication."

Bushings Give Good Results

Oilite bushings are being used on production machinery in 11 of 12 mills reporting. Results are "fair" at one mill and "good" to "excellent" at 10 mills.

Here are some of the typical mill answers:

Mill A—"We are getting excellent results from Oilite bushings. We use them on card-cylinder bearings, card licker-in bearings, loom batteries, and any plain bearing that does not have tremendous pressure."

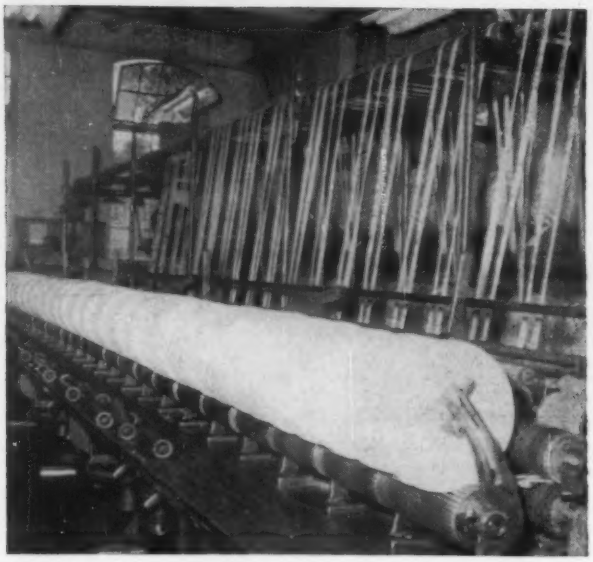
Mill B—"We put Oilite bearings in all rocker-shaft bearings in our looms in 1952.

"In 1954, we bushed all the feed rolls on our cards and built up our feed-roll shafts; now we're getting more-uniform sliver."

Mill C—"We get good results from Oilite bushings on most applications with low revolutions per minute. We have Oilite bearings on card doffer-cylinder bearings, openers and pickers, spinning frames, and several loom parts."

Mill D—"We are fairly successful in using Oilite bushings on looms. We use them, for example, on cam followers, take-up rolls, and large and small end disks on the battery."

MODERN GILLING begins operations at Bell. There are three processes, with four doublings at each machine.



REDUCING is done on a Saco-Lowell machine. One end is fed to a side, and the draft is 4.0.

Short-Cut Methods Produce French-System WORSTED YARN

• A combination of new gill-boxes and French drawing frames is giving this mill results equal to French-system yarn manufacturing. The short system eliminates one to two drawing operations and offers savings in labor costs.

By **MICHAEL LONDON,** Assistant Editor, TEXTILE WORLD

An adaptation of new gills and French drawing frames is giving Bell Co. of R. I., Woonsocket, R. I., results equal to French-system yarn manufacturing. The short-cut system eliminates one to two operations of conventional French drawing.

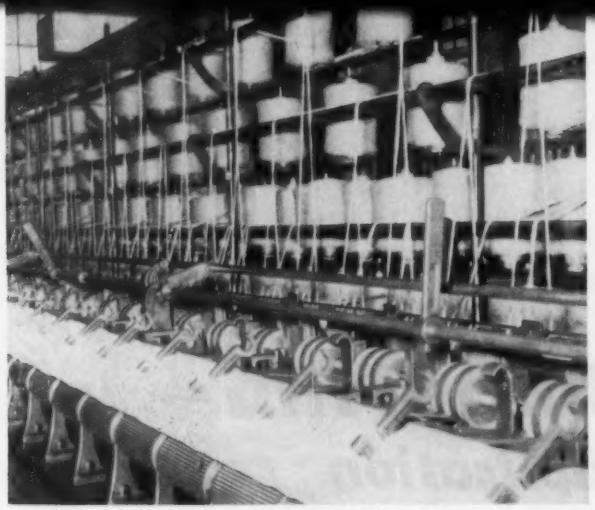
Bell produces 1/13.5s to 1/36s worsted yarns from 58s to 64-70s wool. The mill uses both domestic and foreign wool in slub-dyed tops in various colors and blends. Some synthetics-wool blends are also used. Yarns go into men's and women's high-style fabrics.

Processing starts with the top entering a Berker gilling machine. Three Berker units comprise the gilling operation at Bell. The first machine has a duo delivery; eight ends are fed into one head. The next unit has a single quad delivery and the third a double quad. There are four doublings at each of the machines. Draft is 8.0 on the second and third machines.

The sliver then goes to a Saco-Lowell reducer, where one end is fed to a side and taken off double-meche. Draft at the reducer is 4.0. Then there are three doublings on a rover with a draft of 4.0 and two doublings on a finisher with a 4.0 draft.

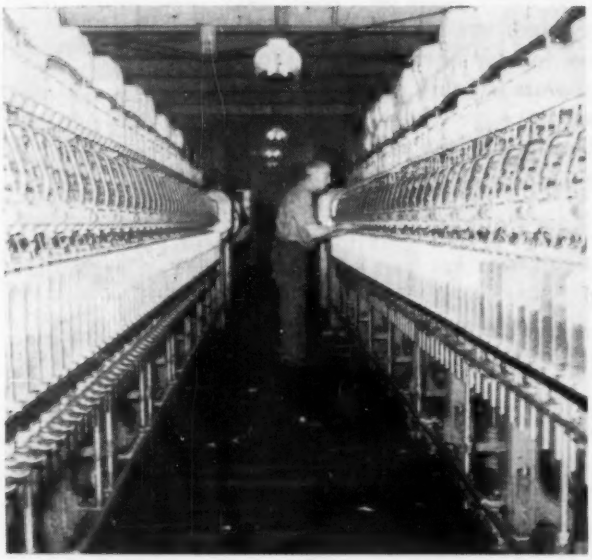
Spinning frames spin yarn from double-meche French roving. There are 24 Whitin FW-3 spinning frames with 200 spindles per frame. The frames have 2½- and 3-in. rings.

The weekly capacity of Bell's Woonsocket operation is 35,000 lbs. of yarn.



ROVER makes three doublings on the sliver. Draft at this operation is 4.0.

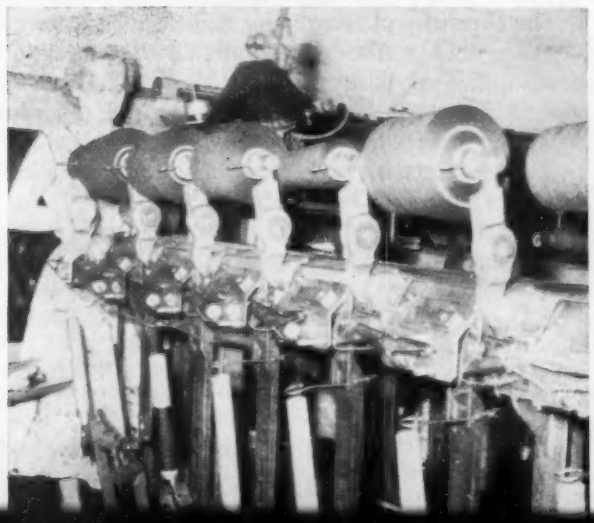
FINISHER prepares roving for spinning frames. There are two doublings with a 4.0 draft.



SPINNING FRAMES are Whitin FW-3 models. They spin yarn from double-meche French roving.

ROTO-CONER winds yarn on cones. The yarn will go into men's and women's high-style fabrics.

ABBOTT WINDER is also used at Bell. The mill produces worsted yarns in numbers from 1/13.5s to 1/36s.



PACKING is done from small trucks that carry the yarn. Paper lining in the containers protects the yarn.

Structure of Cotton

COTTON CRUSHPROOFING—
Theory, Chemistry, Application

One of the surprises of the textile industry in late years has been the almost overnight success of cotton fabrics treated with washfast, wrinkle-resistant finishes.

Such finishes have been used for some years on rayon; but because of fiber differences, they were not very successful on cotton. Today, crushproof cotton fabrics have a large share of the textile market; but still progress is being made in crushproofing materials and techniques.

In this report on cotton crushproofing, the authors give a brief background on this type of processing and explain—

- **How cotton fiber reacts to resin finishes**
- **How crushproofing works on cotton**
- **The types of chemicals used**
- **Pointers on applying the finishes**

By **HECTOR C. BORGHETTY**, Rohm & Haas Co.
D. FORNELLI, Textile Consultant (Europe)

The underlying principles for crushproofing effects were established two decades ago in England by Tootal Broadhurst Lee Co. Ltd. and have been applied extensively in the U. S. on rayon fabrics. They remained dormant, however, for use on cotton until the advent of the man-made fibers sparked the investigation of chemical-finishing techniques.

Substantial interest and a great many technological advances were later made possible with the introduction by Jos. Bancroft & Sons Co. of highly styled chemicophysical finishes produced with thermosetting resins. These effects, in addition to being durably glazed or embossed, were often crush and shrink resistant. The transition to wrinkle resistance as a major requirement of cotton fabrics thus became a logical step for plants equipped to apply synthetic thermosetting resins.

The chemistry of these resins and their behavior on cellulose fibers had meanwhile attracted the attention of scientific investigators such as Marsh (1), Gagliardi and Gruntfest (2), and Buck and McCord (3), who paved the way for the amalgamation of theoretical and practical aspects so well presented in many salient points in an AATCC intersectional study (4).

Since then, much progress has been made and is still being made on large-scale production of cotton crush-resistant fabrics.

tend to lessen the swellability of the

Structure of Cotton

When viewed under the microscope, the cotton fiber appears as a flattened tube showing a spiral effect along its main axis; the cross section is bean-like in shape and shows a hollow center (Fig. 1).

These structural features are important in classifying various fiber sources and relative degrees of maturity and thus in determining the appropriate end uses.

The spirality and cross section also bear a direct relationship to susceptibility to creasing; a bean-like structure tends to crease more readily than a round one. In fact, swelling the fiber to obtain a round cross section is an aid in creaseproofing. The spirality is more noticeable and more frequent in mature fibers and is attributed to the tensions and stresses that occur during growth. Elimination of these fiber stresses present in the cellulose molecule will assist in rendering the fibers crease resistant.

Fibers that have been swelled by chemical means (NaOH, etc.) show bands of fibrils that are slanted at an angle of 20 to 50° along the main axis according to the source of the cotton (Fig. 2). These fibrils are composed of microfibrils formed by bundles of molecular chains of cellulose (Fig. 3, A).

Micelle Distribution Varies

The micelle distribution shows a considerable degree of irregularity and gives rise to a definite pattern of alternate areas that can be classified as crystalline and amorphous. In the crystalline regions (about 75% of the total), there is a great deal of harmony or parallel alignment of micelles and high order of orientation, whereas in the amorphous portions there is much random distribution (Fig. 4, page 104).

The amorphous areas can be penetrated readily by low-molecular-weight cross-linking reactants, such as aldehydes, to give decreased fiber swellability and increased shrinkage control and crease resistance without modifying the feel or bulk of the final fabrics.

Between the tiny fibrils there are capillary networks that can be readily reached by colloidal solutions, while the microcapillary structures inside the fibrils can be reached only by true solutions (Fig. 3, B).

The various capillary systems can be made accessible by chemical-finishing techniques that first penetrate the external porous openings of the fiber. During resin finishing, we are greatly concerned with the phenomena of fiber swelling, absorption, chemical reaction, and the degree of accessibility to the microcapillaries and to the crystalline and amorphous regions.

Creaseproofing Depends On Porosity

The porosity of the fiber varies enormously according to the swelling effect of the chemicals used and to surface activity. It is, furthermore, greatly affected by the moisture regain of the fiber. Consideration of these fundamental facts forms the basis of successful practical application of creaseproofing operations.

Inside the microcapillaries, the accessible portions of the crystalline structure are, of course, closely akin to the amorphous areas except in their degree of molecular attraction. In the crystalline areas, the forces of attraction are strong because of the vicinity and linearity of the —OH groups of adjacent cellulose chains that can give rise to greatly accentuated hydrogen bonding.

The crystalline regions are not accessible to water but can be reached by swelling agents, such as caustic soda or cuprammonium solutions, that can readily break down the van der Waals forces of attraction between the chains and even lead to permanent swelling (mercerization) or molecular disintegration. On the other hand, where the forces of attraction between the molecular chains are weak, as in the amorphous regions, there is ready access by water, colloidal solutions, dyestuffs, and synthetic resins of low molecular weight.

The amorphous areas, by their property of allowing freedom of movement to the molecular chains, account for the flexibility and extensibility of the cotton fiber (5).

Overdrying Causes Changes

The entrance of water or steam into the amorphous layers causes primary swelling of the fiber. On subsequent drying to complete elimination of all regain moisture, the cotton fiber becomes somewhat hydrophobic and crush resistant, a condition that gives much trouble to textile processors who are not aware of the reason for this effect. It is a consequence of the increased attractive forces of —H bonding between the cellulose chains of the amorphous regions.

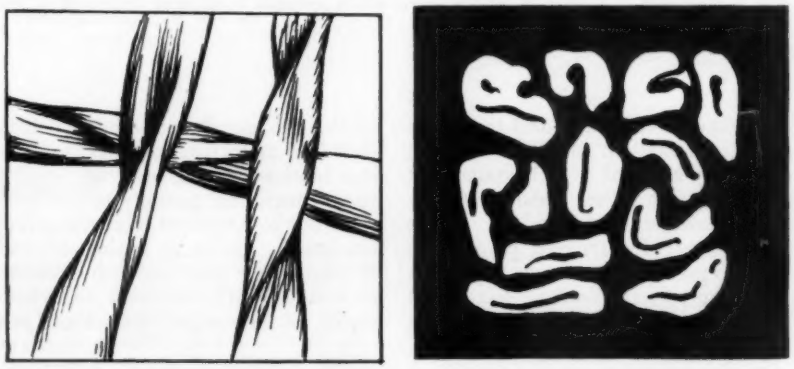


Fig. 1. Spiraling of cotton fibers (left). Cross section at right shows flattened-tube effect and empty core (lumen).

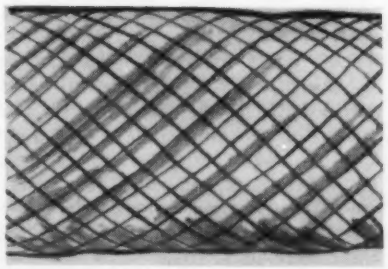


Fig. 2. Cotton fibers swelled by chemical means (NaOH, etc.) show fibrils slanted at an angle of 20 to 50° to the main axis, depending on the source of the cotton.

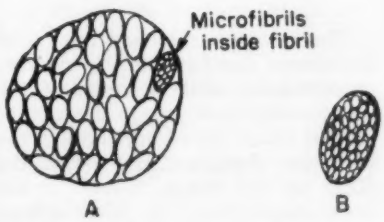


Fig. 3. At *A* is a cross-sectional view of a fibril of cotton fiber showing its relation to the microfibrils at *B*. Microfibrils are in turn made up of bundles of molecular chains of cellulose.

two fibers is the moisture regain: 11% for rayon against 7% for cotton. This

to slip one over the other to cause permanent deformation. The result-

attractive forces that do not allow water to enter the amorphous regions

Cotton Crushproofing (Continued)

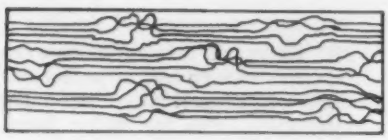


Fig. 4. Crystalline and amorphous areas of the cellulose molecule. The amorphous areas are the irregular, bumpy portions.

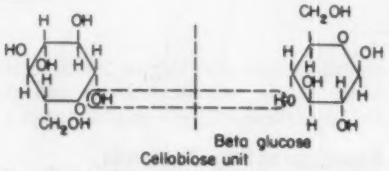


Fig. 5. Cellulose micelles are composed of long molecular chains of the disaccharide cellobiose derived from beta glucose.

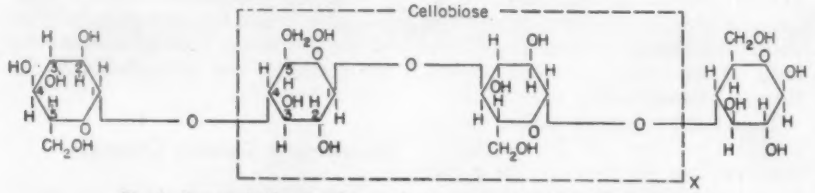


Fig. 6. Oxygen-bridge bonding at 1, 4 positions of the cellobiose unit.

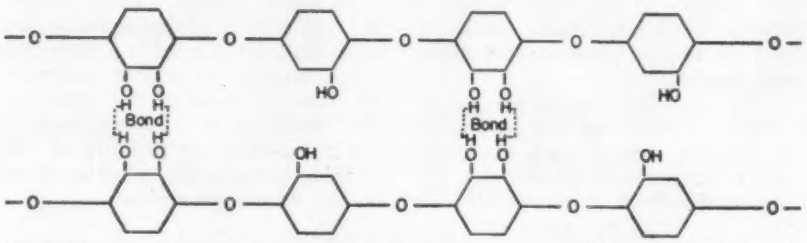


Fig. 7. Alignment of micelles in parallel layers allows hydrogen bonding as illustrated in this formula.

Although we have termed the region as one of random distribution, there are many adjacent —OH groups that come closer together when all the regain moisture is driven off. These new forces of attraction permit the fiber to go beyond its original position after the primary swelling has ceased and render it hydrophobic. The effect of the 7% moisture regain of cotton (8.5% in mercerized cotton) that acts as a lubricant of the molecular chains to give increased mobility to the fiber must not be neglected in any finishing operation. Synthetic resins of the thermosetting type used to stabilize or wrinkleproof cotton also create new forces of molecular attraction and tend to lessen the swellability of the fiber and also its moisture regain.

The higher the percentage of amorphous area of the cotton, the higher the swellability and extensibility and the lower the resistance of the cotton will be. Some comparative crystallinity percentages are:

	Per Cent
Natural cotton	— 80 to 90
Kier-boiled cotton	— 75 to 80
Mercerized cotton	— 70
Viscose rayon	— 40

How —H Bonding Occurs

The micelles are composed of long molecular chains of cellulose of 2,000 to 3,000 units. These units in turn are made up of repeating units of a disaccharide termed cellobiose that is derived from beta glucose (Fig. 5). The units are all bound by 1, 4 oxygen bridges (Fig. 6).

When the various micelles are aligned in parallel layers, the adjacent —OH groupings are close together to allow the forces of hydrogen bonding, shown as "Bond" in Fig. 7, to give rise to the crystalline areas. The —OH groups will react chemically with alkalis, organic acids, anhydrides, nitric acid, aldehydes, etc.

When a cotton fiber is bent, the molecules in the amorphous regions can shift but those in the crystalline areas are held tenaciously. The deformation in the amorphous areas is, therefore, apt to be permanent or very long lasting. The creaseproofing of cotton can be based on the protective action against permanent creases by adding new forces of attraction in the amorphous regions by reaction with aldehydes (in the presence of acid catalysts) to impart primary bonds. Alternately, synthetic resins may be condensed inside the amorphous areas to prevent movement of the chains during the bending process.

How Creaseproofing Works

The invention disclosed by Tootal Broadhurst Lee Co. Ltd. (6) consists of depositing synthetic resins of the urea-formaldehyde type in the interior of the fiber. More specifically, the resins are deposited in between the fibrils and also the microfibrils, as has been demonstrated by X-ray diffraction patterns and by study of the dyeing properties imparted by the resins to acid dyestuffs (7).

The immediate success of the T.B.L. process on rayon and the drawbacks in its use on cotton can be attributed to the morphological differences between the two fibers. The most serious drawback is the high crystallinity of cotton, which causes a loss of tear strength when the crystalline areas become cemented to amorphous areas that have been overreacted and rendered brittle.

The understanding of the mechanism of treatment, together with the accumulated experience on rayon and the realization that a compromise between degree of crush resistance and minimum loss of tear strength should be made, were the determining factors that finally led to satisfactory plant processing.

Rayon vs. Cotton

Rayon, a highly amorphous fiber in which the crystallinity is more intimately associated with random distribution areas, suffered less decrease of tear and elasticity. Another very important difference between the

TABLE III

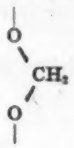
1. Formation of covalent linkages **2. Formation of resin polymer** inside ties of the cellulose fiber so that it no longer

two fibers is the moisture regain: 11% for rayon against 7% for cotton. This moisture is essential to the tensile strength of cotton (each 1% regain gives 5.5% more tensile strength), while the reverse is true for rayon. Any resin treatment that lowers the moisture absorption is thus beneficial to rayon and harmful to cotton.

Hydrophobic rayon yarns of decreased swellability are in themselves much more laundry resistant than untreated rayons. Therefore, resin treatment of rayon performs an advantageous function apart from the stabilization against shrinkage. Rayon also acquires a 100% increase in wet resistance on treatment with resins, whereas cotton loses 30% (Table I).

The effect of specific resin treatment is shown in Table II.

The mechanism of reaction of U.F. resin on either cotton or rayon is the same, and any difference is due to fiber structure and not to chemical behavior. The end result of a formaldehyde reactant on cellulosic fiber in acid environment is to form oxymethylenic bridges between the —OH groups of the adjacent cellulosic chains in the amorphous regions:



Thus, the chains are no longer free to slip one over the other to cause permanent deformation. The resultant accompanying decrease in fiber swellability caused by the addition of attractive forces that do not allow water to enter the amorphous regions gives the increased stabilization to washing and the creaseproofing effect.

TABLE I

Fiber Properties After Treatment with U.F.-Resin Precondensate

		Viscose rayon	Cotton
Elastic recovery from creases	Dry	Increases	Increases
	Wet		
Shrinkage control	Dry		
	Wet		
Tensile strength	Dry	Decreases	Decreases
	Wet		
Tear strength	Dry		
	Wet		
Abrasion resistance	Dry	Decreases	
	Wet	Increases	

TABLE II

Effect of Creaseproofing on the Mechanical Properties of Rayon and Cotton Fabrics

Treatment of fabric	Crease recovery (%)	Shrinkage (%)	Tensile strength (lbs. per in.)	Tear strength (lbs.)	Abrasion resistance (TBL cycles)
Viscose rayon (% solids)					
None (control)	48	10.3	47	9.2	2,900
10% formaldehyde	75	2.2	34	1.4	180
Cotton sheeting (% solids)					
None (control)	40	4.2	42	3.6	5,200
10% formaldehyde	71	0.9	21	2.2	420

Types of Chemicals Used

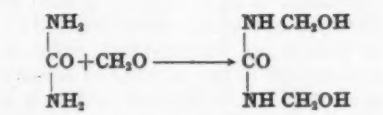
The resin precondensates used to impart creaseproofing are all monomeric and are derived by condensation of formaldehyde with urea or other amines such as triamino triazine (melamine). Modified urea-formaldehyde types known as difunctional reactant resins give the same results without building up the feel or bulk of the fiber because they do not form three-dimensional polymers.

All successful crushproofing agents contain formaldehyde, and it is the consensus of most authorities that formaldehyde is able to form the necessary cross links with the —OH groups of the cellulose whenever it is reacted on the acid side. Crushproofing without chemical crosslinking is also achieved by polymerizing amino-formaldehyde resin inside the fiber; however, again we note the presence of the essential formaldehyde. In either case, the amorphous regions are rendered hydrophobic and less liable to permit molecular shifting. A typical polymer-producing resin for use on rayon is derived by reaction of urea and formaldehyde as indicated in Fig. 8.

Gagliardi (8) was able to demonstrate the formation of a three-dimensional polymer with this resin on the alkaline side to give crushproofing without any possibility of the reaction of formaldehyde with the reactive cellulose groups. This work paved the way to the study of crushproofing mechanisms that would be effective in alkaline swelling mediums.

The crushproofing mechanisms are summarized in Table III on page 106.

The chemicals used for crushproofing are described here under three types: (1) cross-linking agents, reactant types; (2) urea-formaldehyde resins; and (3) thermoplastic-resin dispersions.



This in turn cross-links when cured to give under acid conditions:

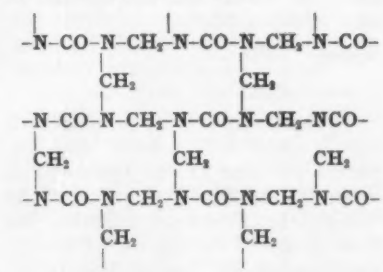


Fig. 8. A typical urea-formaldehyde polymerizing resin useful on rayon is formed from the reaction shown here.

less damage to the fiber when used at equal quantity to other resins, but at the same level of crush resistance the is accessible only to reactants that give molecular solutions; therefore, damage to fiber properties is a conse- ities. They do give a decided improvement in tear strength.

The best lubricant for the molecu-

Cotton Crushproofing (Continued)

TABLE III

1. Formation of covalent linkages between formaldehyde and adjacent chains of cellulose:

cell–O–CH_2–O–cell

or,

cell–O–CH_2–O–CH_2–O–cell

For glyoxal, the cross linkages are considered to be:

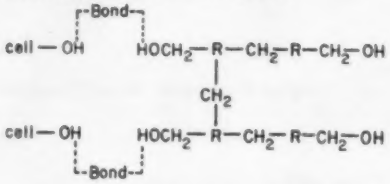
cell–O–CH(–O–cell)–O–cell

A reactant resin containing formaldehyde that does not form a three-dimensional polymer:

cell–O–CH_2–R–CH_2–O–cell

R is the residue of a methylolated urea derivative.

2. Formation of resin polymer inside the amorphous regions exclusively gives hydrogen bonding of three-dimensional polymers to the adjacent –OH group:



The effect of hydrogen bonding, although not as durable to washing as is the formaldehyde covalent linkage, is extremely effective in hindering the slipping of the cellulose chains during creasing. It also is similarly effective in reducing the hydrophilic properties of the cellulose fiber so that it no longer swells and shrinks as much as untreated fibers.

3. Coating techniques. Coating of the fiber crevices with three-dimensional polymers forms a hydrophobic effect that reduces swellability and locks the molecular chains. Linear polymers (syrups) can produce a similar effect by coating the outside of the fiber and diffusing inside as well. This means of crushproofing is much-less efficient than either 1 or 2 but often accompanies that described in 2. In fact, a combination of all three mechanisms can occur wherever * polymeric-forming resin is used. This action has been illustrated by Nuessle (9), who shows the nine different interreactions involved.

A. Cross-Linking Agents (reactant types)

The formaldehyde reaction to cellulose in the presence of acid catalysts gives good stabilization and crushproofing but decreases the tear and tensile strength of the fiber. In addition, the volatility and irritability of formaldehyde fumes are deterrents to its use. Moderation of the formaldehyde effect can be obtained by condensing it with other compounds. Some examples of such reactants are:

Formaldehyde: HCHO

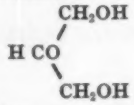
Applied by saturating the fiber with 3% formaldehyde in the presence of a catalyst, drying and curing at 300° F. for 3 mins., this reactant gives excellent stabilization and crushproofing but reduces physical properties. The maximum amount of combined formaldehyde satisfactory on fiber is 0.5%. The reactant is volatile and irritable.

An ingenious means of utilizing the formaldehyde reaction without the drawbacks of high volatility is used in the Avcoset process, where the HCHO is bound to hydroxyethyl cellulose and applied in the presence of sulfuric acid at pH 1.3. Sodium sulfate is a necessary buffering component to eliminate any tendering of the viscose fiber, on which the process can be successfully applied.

Glyoxal: CHO–CHO

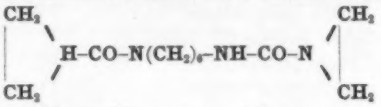
This product acts as formaldehyde but is much-less volatile and has proved of value in the treatment of rayon by the Sanforset process. Although the defect of volatility has been remedied by the use of this dialdehyde, glyoxal imparts harmful effects to cotton fiber and is therefore confined to use on rayon. Polyvinyl alcohol and hydroxymethyl cellulose with which it also cross-links are used to give firm hand in addition to stabilization.

Dimethylol formamide (Kaurit FI, WF):



This reactant is a hydrophobizing and stabilizing agent for rayon.

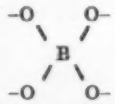
Ethyleneurea condensate of hexamethylene-diamine (Kaurit AI, Hoechst 105):



This produce cures without a catalyst and stabilizes rayon.

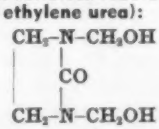
Borax: $Na_2B_4O_7$

Borax is considered able to form a polymer that can cross-link the —OH groups:



It is used as a nondurable crushproofing agent for spun rayon in the proportions of 20% borax, 3% lactic acid, and 1% fatty alcohol sulfate. The fiber is saturated, dried, and cured.

Difunctional cellulose reactant (dimethylol ethylene urea):

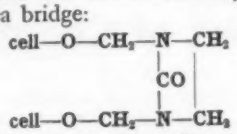


This reactant is the most-successful formaldehyde-containing agent for use on cotton. It has high chemical reactivity, good washfastness, and good chlorine resistance. In addition, it is not a resin-former and does not cross-link to itself to give three-dimensional polymers; therefore, it does not build up the feel or hand of fabrics. When heavy finishes are desired, this resin is used with polyvinyl alcohol, hydroxyethyl cellulose, starch ethers, or other formaldehyde-fixable water-soluble polymers.

How Bonds Are Made

The reactant resins give covalent bonds to cellulose in a manner similar to formaldehyde:

R is –CH_2– for formaldehyde, or represents the residual dimethyl-ethylene-urea bridge:



Under controlled conditions of application, the crushproofing process affects the cotton fiber differently according to the nature of each specific resin and to the quantity of resin deposited. There is a further possibility that reactant-type solutions of low molecular weight and size may penetrate the crystalline areas and cause cross-linking of a complex nature in the very-crystalline areas. The movement of the volatile formaldehyde during the drying process is difficult to trace and could conceivably yield covalent cross links other than in the amorphous regions.

How Resin Affects Fiber

Tests have shown that for each specific resin, either of the polymerizable or reactant types, the decrease in tear strength follows the increase in quantity of resin applied. Some resins show

Cotton Crushproofing (Continued)

less damage to the fiber when used at equal quantity to other resins, but at the same level of crush resistance the damage is approximately equal.

Dimethylol urea, which can be made to cure with alkaline catalysts and thus exclude any possibility of cross links on adjacent cellulosic chains, also gives damage in direct ratio to the amount used. The decrease in physical properties does not always become intrinsic with the fiber and is attributed to the presence of polymer resin. In fact, the original fiber properties return if the resin is removed by hydrolysis with acid, and it is noted that the cuprammonium fluidity of the fibers shows no change.

This restoration of fiber qualities has been observed for thermosetting polymerizable resins only and cannot be accomplished when formaldehyde, glyoxal, or other formaldehyde-containing reactants are used. This fact is interpreted as a confirmation that the formaldehyde causes covalent cross-linking, whereas polymerized resins function by hydrogen-bonding that can be broken on hydrolysis of the resin.

The theory that the resin occupies the capillaries of the amorphous regions and thus lowers the mobility of the molecular chains has been illustrated as the effect of hinges whereby the amorphous areas become immobilized by the cross links. When the fiber is subjected to bending, the internal movement of molecular chains can no longer be uniformly distributed along the fiber and eventually the strain will cause abrasion or breakage rather than creasing.

What Causes the Effects

The resin itself affects the fiber differently according to the molecular size and diffusibility of the resin. The entire amorphous region of the fiber is accessible only to reactants that give molecular solutions; therefore, damage to fiber properties is a consequence of resin diffusibility and distribution.

The least-harmful resins are those that have high molecular weight and thus less diffusibility. The greater effect on fiber physical properties caused by formaldehyde can be attributed either to its greater diffusibility, lower molecular weight, greater reactivity, or the fact that it requires a lower pH to initiate reaction.

All abrasion-testing machines show a decrease in abrasion resistance with the increase in resin content in either cotton or rayon fabrics. The greater losses are always associated with formaldehyde wherever it has reacted to give oxymethylenic bridges in cellulose (–O–CH_2–O–CH_2–O–). Greater length of cross links are postulated to be more flexible and, therefore, less apt to rupture. Gagliardi and Nuessle (10), prepared materials to study this extremely important point, which is analogous to the occurrence of the flexible –S–S–, di-sulphur linkage of wool.

Fiber Stiffened Inside

The abrading testers cause intermittent and often reversing strains that give a shift of threads and fibers. Inside the fiber itself, wherever there are covalent bonds, hydrogen-bonding, or blocking of the amorphous zones, there is a decrease in mobility with subsequent decrease in extensibility that does not allow play to the uniform distribution of the forces of stress between the micelles.

Lubricants would tend to allow greater mobility of the cellulose; but unfortunately all the known softeners, because of their bulky molecules, cannot enter the fiber to impart any real improvement to cotton abrasion qualities. They do give a decided improvement in tear strength.

The best lubricant for the molecular chains is the moisture regain, but regain is lowered by the various agents used in crushproofing. No comprehensive study has appeared on this important point. Such a study would lead to much information of value in facilitating plant procedures, particularly in controlling conditioning before and after resin treatment.

How Abrasion Is Controlled

Control of the abrasion qualities is possible by the use of thermoplastic resins, cellulose ethers, polyvinyl alcohol, or polymeric urea-formaldehyde syrup resins, all of which impart a continuous or semicontinuous coating to the fibers and yarns and protect the fabric from the abrading surfaces.

Some of these products also act as binding agents for the fiber and thus distribute the wear to other fibers with consequent increase in abrasion and tensile strengths. This principle is used to reinforce many fabrics that are subjected to severe conditions of yarn slippage, such as for pocketings and lining cloth. (11)

Control of resin distribution by appropriate selection of reactants can lead to improved results in physical qualities.

The effect of soiling is related to that of abrasion as shown by the fact that the collar of a shirt retains more dirt than other areas. The bending at the collar is severe, and any strain on it is multiplied many times because of the addition of the forces of compression to those of bending and twisting.

The increase of abrading action in the presence of soil can be attributed to the cutting action of minute particles of dirt. The fiber and yarns are also opened up more and tend to retain the soil more tenaciously.

B. Urea-Formaldehyde Resins

The urea-formaldehyde condensates constitute the most commonly used group of thermosetting resins (Table IV, page 108).

Resins of the monomeric type are used both in Europe and the U. S. for the great majority of stabilizing and crushproofing effects on rayon. They are also employed in Europe for cotton but cannot be recommended for this fiber in the U. S. because of the severe loss in strength they impart on contact with chlorine.

Of great simplicity, both in regard to chemical constitution and manufacture, they have the drawback of poor storage stability above 60° F. and are therefore manufactured on location by textile mills or are shipped and stored under refrigeration.

Commonly designated as U.F. monomeric pastes, they can be produced by condensing urea and formaldehyde at various ratios to give different degrees of mono- and dimethylol urea. The mole ratio of one part urea to two parts formaldehyde corresponds to dimethylol urea and gives greatest efficiency of crushproofing but also greatest loss in the wearing properties of the cellulose fiber. Ratios of about one part urea to 1.6 parts formaldehyde are preferred. The tri- and tetramethylol ureas are not used commercially because of instability and excessive formaldehyde content.

For immediate use, the monomeric resins are prepared at 25 to 30% active content in liquid form, whereas for shipment they are supplied either at 40 to 60% paste form or as crystalline powders. The resin condensate must be in strict monomeric form for best solubility in water and good diffusibility into the fiber.

The poor stability of monomeric U.F. resins has been overcome by the development of new types that are

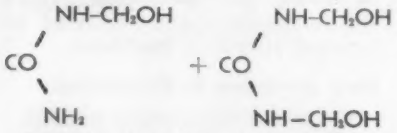
factory for use in the form of acid ... Both the monomeric condensate or ... that of the urea-formaldehyde mon-

TABLE IV

Thermosetting Crushproofing Agents

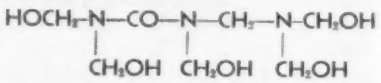
(These agents form tridimensional polymers)

Urea formaldehyde (mixtures of mono and dimethylol urea)



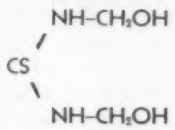
Satisfactory for shrinkage control and crushproofing of rayon. Not recommended for cotton on account of poor durability and very severe chlorine damage. Poor bath stability makes mild catalysts necessary.

Urea formaldehyde polymeric precondensates (linear polymers that can be acid-catalyzed further)



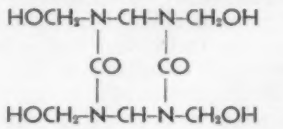
Not sufficiently diffusible to give good crushproofing. Used to assist in giving surface resin effects and bulky hand. Severe chlorine damage. High storage and bath stability.

Thiourea formaldehyde monomer (dimethylolthiourea)



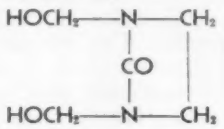
Same properties as U.F. monomers. More expensive. Has bad odor and changes the shades of dyestuffs. Poor chlorine resistance.

Acetylene urea precondensates (Kaurit AFI, 140, Glyfix. Tetramethylolacetylene diurea, made from glyoxal)



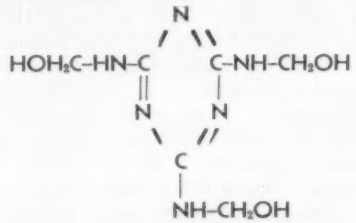
Act like U.F. monomers, but more stable and give a softer hand. Used primarily in Europe.

Difunctional monomeric reactant (dimethylolethylene urea)



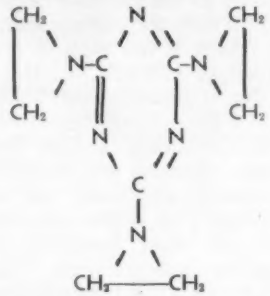
Not a resin former. See Table III, which shows the cross-linking reactants.

Melamine formaldehyde monomeric precondensates (trimethylol melamine and its ethers)



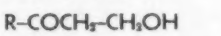
Same uses as U.F. monomers. More expensive. More stable to chlorine, show little damage but much yellowing.

Ethylenimine condensate (Hoechst I–193 triethyleniminotriazine)



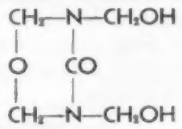
Experimental. New type that polymerizes at 160° F.

Ketone aldehyde precondensates (acetone formaldehyde type)



Used on rayon with alkaline catalyst. Has no chlorine retention.

Hydantoin and Uronformaldehyde precondensates (dimethyloluron)



Not widely used because of difficult polymerization.

obtained by condensation with methyl alcohol to give methoxyethers of methylol urea that possess good chemical and storage stability; e.g., dimethoxymethylurea ($CH_3O\ CH_2NH\ CONH_2O\ CH_3$).

Although similar in fabric finishing effect, this modified type imparts a somewhat thinner hand and slightly less crushproofing than the standard urea-formaldehyde monomers and is twice as expensive. The methoxy derivatives are sometimes referred to as polyfunctional U.F. ethers, and they are able to form three-dimensional polymers inside the fiber and also have greater possibility to cross-link to the cellulose than the standard U.F. monomers.

There is another category of U.F. resins known as polymeric condensates or syrups that are actually linear polymers able to cross-link further to give three-dimensional thermosets useful to modify fiber hand and bulk.

These polymers are not able to diffuse much into the fiber and are, therefore, of little value for giving covalent links or hydrogen-bonding and of little use as crushproofing agents, except to help in sealing the fibers. They are often necessary to give the required variation in finish of the fabrics. Syrup resins are stable chemically, can be stored indefinitely, and are acid-catalyzable.

Melamine-Formaldehyde Resins

Melamine can be reacted with formaldehyde to give methylol derivatives that give resins of good durability to washing. Because of its greater basicity, melamine yields thermosets that are much more resistant to chlorine; but they turn yellow in the presence of minute traces of chlorine and are unsuitable for white or pastel shades.

An attempt has been made to counteract this yellowing by using bivalent metal salts, such as magnesium chloride, as catalysts. The resultant chelation of the metal ion by the melamine-resin polymer eliminates chlorine absorption, damage, or yellowing at low temperature (below 100° F.) But at the higher temperatures that prevail in the household (140° F.) and in the AATCC wash test (180° F.), the protective action of the magnesium ion is nil.

Melamine-resin monomers can be used wherever urea types are employed. Although far more expensive, they have advantages in solubility and ease of catalysis and are satis-

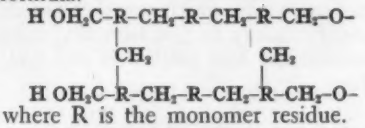
Cotton Crushproofing (Continued)

factory for use in the form of acid colloids to give a quick and simple procedure of application that eliminates curing at high temperature. However, they are not sufficiently durable. (12)

Modified Melamines

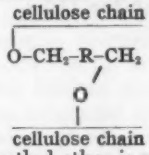
Modified methylolated melamines obtained by condensation with alcohols to give ethers are readily available (Fig. 9).

Both the monomeric condensate or its ether can polymerize under acid catalysis to form tridimensional polymers that can be represented by the formula:



where R is the monomer residue.

In this type of product, some cross-linking of the resin to cellulose, as in that of the urea-formaldehyde monomers, can also be considered possible.



The trimethyl ether is used on wool for shrinkproofing and can be used with the regular melamine condensates to give crease resistance on cotton.

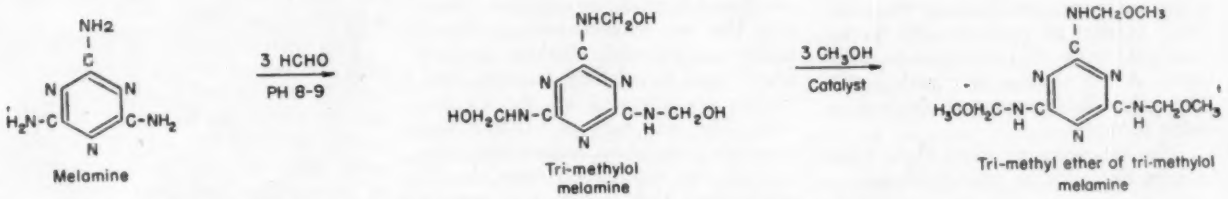


Fig. 9. Ethers result when methylolated melamines are further treated with alcohol to form condensates.

C. Thermoplastic-Resin Dispersions

This group of resins enters into the crush-resistance picture mainly as auxiliary products that serve to build up the hand of the fabric and give increased abrasion resistance. Being non-nitrogenous in character, they do not impart any undesirable chlorine retention.

The present thermoplastic-resin dispersions are milky liquids composed of polyvinyl acetates, polyacrylates, esters of acrylic and methacrylic acid, polyvinyl chloride, alkyds, etc. Many can be applied in conjunction with all thermosetting resins without any further additions except ammonia to regulate the pH for those that are alkaline and would not otherwise mix with the acid catalyst.

New modified acrylic types possessing unusually good pigment-binding qualities and the ability to perform this function in the presence of thermosetting resins have been introduced. They already point the way to simultaneous dyeing and finishing techniques that will further streamline textile-mill processing. Fabrics have already been processed by padding pigment dyes, thermosetting resins, and thermoplastic binders and curing or embossing to impart stabilization, crushproofing, and color in one continuous operation.

Thermoplastics Are Self-Finishes

The thermoplastic resins, because of their property of becoming insoluble and washfast without the additional process of curing, are receiving much attention even as self-finishes.

None of the present thermoplastic dispersions possess any aldehydic groups to react with cellulose to give a chemical union, but many have been introduced that contain —COOH groups that could be transformed to the amido function and then become reactive, at least to formaldehyde-containing thermosetting compounds.

The present drawback of the thermoplastics is their large macromolecule that does not penetrate the capillary network of the cotton fiber but simply anchors to the outside structure and coats it with a more or less firm transparent film. This film, if in excess, interferes with the crease-proofing effect. Synthetic rubbers have shown better results in this respect.

Attempts to polymerize the monomer of the thermoplastic resin inside the cellulose have not yielded good results in crushproofing because the linear polymers formed are not able to hold the linear cellulose side chains under the stress of bending, as do the three-dimensional polymers of the thermosetting resins.

Catalysts That Work Well

The purpose of the catalyst in the crushproofing process is to accelerate the reaction and render it applicable to textile-finishing equipment. This reaction is achieved by developing the correct acid pH during the heat-curing cycle. Many suitable catalysts have been developed for use with urea formaldehyde and melamine resins on spun-rayon fabrics. The most popular are the salts of ammonium, particularly the lactate and various phosphates.

The main requisite is that the catalyst be compatible in the resin solution for several hours and be able to develop sufficient acidity to cure quickly. The length of cure, the temperature, and acidity are all interrelated and are governed for each weight and type of cloth.

For best plant efficiency, the speed of the cloth permits it to remain in the curing unit 1 to 3 mins.; and the curing temperatures should be respectively 360 to 300° F. The higher the temperature the faster the cure but the greater the danger of scorching the fabric in case of a breakdown in the mechanical setup.

Generally speaking, the resin-curing catalysts belong to the following groups:

1. Organic acids
   (acetic, tartaric, oxalic, lactic)
2. Metal salts
   (aluminum, magnesium, copper, zinc or calcium chlorides)
3. Ammonium salts
   (chloride, sulfate, phosphates)
4. Organic amine salts
   (mostly hydrochloride salts)

A good catalyst should not materially reduce the stability of the resin bath.

Watch Out for Odor

Odor formation is another important aspect of catalyst choice.

Ammonium salts are considered disadvantageous because they react with formaldehyde and form the objectionable methylamine odor that is often evolved during application of resin treatment or after prolonged storage of fabrics that have not been afterwashed. The trend away from nitrogen-containing catalysts to eliminate the formation of methylamines is not completely justified because the resin itself is able to produce odor under catalysis with non-nitrogenous catalysts. A hot alkaline afterwash is still the only reliable means of eliminating odor formation.

The following reactions show what causes the odor in resin-finishing:

$$NH_3 + 3HCHO \rightarrow N(CH_3)_3 + 3O$$

The trimethylamine formed by ammonia liberated by ammonium-salt catalysts is the most serious source of odor because of its fish-like characteristics. The smell of formaldehyde is often a reason for complaint, but it is of a minor nature.

Recommendations made to inhibit odor formation by adding urea or dicyandiamide are based on tying up the free formaldehyde by suitable formaldehyde acceptors. These acceptors tend to lower the probability of the odor reactions but also change the mole ratio of urea or melamine to formaldehyde, and thus the working properties of the monomer. They also add N as a further source of trouble.

Overcuring May Cause Odor

Many of the odors that develop on fabrics that have not been afterwashed can be attributed to overcure of the resin by excessive or prolonged heating that liberates both formaldehyde and ammonia, which together possess latent capacity to give trimethylamine because the acid catalyst is still available:

$$HO\,H_2CHNCO\,NH\,CH_2\,OH \xrightarrow{H^+} 2HCHO + H_2NCO\,NH_2$$

$$H_2N\,CONH_2 + H_2O \xrightarrow{H^+} 2NH_+ + CO_2$$

This reaction does not occur with alkali; and it would be expected, therefore, that any methylamine developed during curing with alkaline catalysts would tend to volatilize because these amines are liberated on the alkaline side. The acid salts of methylamine normally present on resin-treated fabrics are not volatile but stay on the cloth until they come into contact with alkaline sources that allow the odor to appear. Present-day formulas with alkaline catalysts do not give the expected protection because they function at too-low alkalinity. This is a strong argument in favor of alkaline catalysis for methylolurea monomers.

Amine-salt catalysts are a relatively recent development and have made considerable progress both for rayon and cotton. Amine salts such as the hydrochloride salt of pyridine or isopropanol amine can be readily adjusted to the right pH for use on rayon where the rather unstable monomeric-resin solutions will not tolerate a low pH. Amine salts readily yield HCl on curing but in this respect are less severe than ammonium chloride.

Strong Catalysts Required

The selection of a good catalyst for use on cotton involves entirely different considerations than for rayon because the reactant resins employed most extensively on cotton will not only stand lower bath acidity but also require strong catalysts that must not harm the fiber.

Ammonium chloride, one of the strongest catalysts, cannot be used with the unstable methylolamino monomers used on rayon and is too strong for use on cotton with reactant resins. Good catalysis was therefore difficult to achieve on cotton until the development of the amine-salt delayed-action catalysts.

This term originated by association with the important use of these catalysts in permanent glazing and embossing where the technique of application required no setting of resin until after the mechanical operation of calendering had been completed. The delayed-action catalysts do not liberate their latent acidity until the cloth is thoroughly dry.

Hydroxyamine hydrochlorides are the most satisfactory amine salts for this use. Being the salts of a very strong acid and a weak base, they yield acid by hydrolysis:

$$(HO\,CH_2CH_3)_3N \cdot HCl \rightleftarrows (HO\,CH_2CH_3)_3N + H^+ + Cl^-$$

For use with reactant-type resins, such as the ethylene-urea difunctional monomer, more powerful amine salts have been developed.

The quantity of catalyst to use depends on the nature and strength of the catalyst, curing temperature, the resin used, and many factors that form an intricate web of variables. Clarification is best obtained by making either a very comprehensive study or by relying on the manufacturer's recommendations for each resin and catalyst.

Effect of Fabric Construction

Experience has shown that the fabric construction plays an important part in the successful production of crush-resistant cotton garments. Relaxed constructions are more suitable than those composed of highly twisted yarns and tightly woven threads.

Many fabrics possess some inherent crush-resistant properties and therefore benefit greatly by the application of synthetic resins. Others show a marked tendency to wrinkle and consequently cannot be expected to exhibit good crease resistance even after resin treatment. Also, the individual fiber properties such as fineness, maturity, staple length, etc. tend to influence somewhat the final results. The only criterion by which the adaptability of a new type of fabric to crease-resisting treatment can be determined is the actual laboratory application of the resin.

Fabrics Selected for End Use

The most successful garments on the market today have resulted from proper selection of fabrics for specific end uses. Constructions such as ginghams and lawns usually show good wrinkle resistance and suitability for resin treatment; broadcloths are difficult to process and often do not warrant the expense of the chemical finishing operation.

When sufficient experience on the suitability of yarns, design, and construction of fabrics for increase-resistance effects has been gained, the textile industry will benefit in terms of correctly styled fabrics and their specific end uses. In the meantime, the finisher is often called upon to resin-treat a variety of cotton cloths of varying degrees of adaptability and must use considerable ingenuity to achieve marketable results. Some published results (13) and (14) can serve as a guide for fabric selection.

Apart from the inherent ability of the fabric to resist creases, there

is the effect of the resin on the physical properties of wear, tear and tensile strength, and abrasion. These properties are affected by the resin treatment and can be influenced by the type of yarns and compactness of weave. Highly twisted yarns that are considered more resistant to strain than those of low twist show the contrary effect when resin-treated and show greater proportional loss of tear and tensile strengths.

Fabric Must Be Clean

The cotton fibers must be completely free from natural and added impurities; therefore, fabrics should be desized and kier-boiled or suitably scoured. Mercerizing causes cellulose to swell and, therefore, possess greater chemical reactivity. Bleaching, particularly with peroxide, assists in rendering the fibers more pure and hydrophilic and is therefore advisable.

If the fabrics are dyed, it is important to return them to their original degree of absorbency prior to resin treatment. Dyed fibers have fewer accessible areas for use by the resin solutions in direct proportion to the intensity of the dyeing. It has been observed (15) that direct dyes do not enter the crystalline areas of the cellulose but when dry remain in an amorphous state in the amorphous cellulose regions. Azoic dyes that are also initially in an amorphous condition are transformed during the after-soaping to a crystalline state.

The same is postulated for vat dyestuffs that are known to change in particle size on soaping and often change accordingly in shade. The occupancy by the dyestuffs of the amorphous areas results in a loss of available space for subsequent occupancy by the resin.

It has also been noted (16) that dye-fixing compounds derived from dicyandiamide applied to direct dyes to render them washfast will often impede the entrance of the resin solution. This is a natural consequence of the hydrophobicity of cationic dye-fixing complexes and must later be offset by the assistance of wetting agents. The wetting agent used must not be anionic because it may precipitate the cationic dye fixative.

How To Treat Different Dyeings

The difference in the accessibility of dyed grounds to resin solutions results in variations in hand on light and dark shades. Aniline blacks are extremely difficult to render crease resistant and require a pretreatment with diazotizing solution followed by scouring (17).

Naphthol dyeings should be scoured thoroughly with a combination of a nonionic detergent, soda ash, and an organic sequestrant (sodium ethylenediamine tetracetate). Together with vat colors, naphthols have the advantage of swelling the cellulose because of the caustic content and thus rendering the fiber receptive to resin treatment.

Vat colors should be thoroughly oxidized with peroxide, perborate, or Textone, in preference to bichromate, which is apt to form chrome soap complexes that are difficult to remove. Chrome complexes markedly decrease the absorbency of the fiber besides interfering with the activity of the resin and cellulose.

Pigment dyeings greatly reduce the absorbency of the cellulose and its reactivity for the resin. Many pigment binders are based on thermosetting resins of the melamine or alkyd type, or both, and thus greatly reduce diffusibility of resin solutions. This tendency can be somewhat overcome by allowing longer contact times in the resin bath or by adding surfactants. Crush-resistant resins of the reactant type may also be added during the pigment-dyeing operation to offset the drawback of the hydrophobicity of the pigment binder.

A margin of safety can be added to all types of fabrics for resin treatment by giving a final rinse with acetic acid before drying to neutralize any alkalinity that would otherwise interfere with the fiber reactivity.

Printed Goods

For printed designs, the problem of fabric preparation is further complicated by the irregularity of the pattern and the variety of chemical formulations utilized in the various outlines, blotches, and pegs. The thickeners used for vat colors, if based upon starch, must be completely washed out to avoid the many complications that arise from poor penetration of the resin solution into the printed areas, with consequent differences in crush-resistant effects.

Poor penetration becomes quite noticeable in heavily covered prints and particularly in blotches. Starch cannot be completely removed, even with rope washing, and often requires a desizing with enzymes. The loss of color value of starch-thickened printed vat colors when they are desized is such that in many cases the printer finds it more convenient to use the more expensive but far more soluble thickeners such as carboxymethyl cellulose, Keltex, or sodium polyacrylate combinations.

The reactivity of starch with amino-formaldehyde resins is another deterrent of starch-based thickeners and becomes evident if the starch is not removed prior to resin treatment. The starch is insolubilized by the resin drying and thus detracts from the crease-resistant effect.

Resin in Print Paste

There is a trend toward addition of resin directly to the print pastes so that it will be on location and compensate for the resin solution applied later to the fabric. This addition of resin cannot be made on dyes that are formaldehyde-sensitive, as would be the case for some Rapidogens and naphthols. Such an addition cannot, of course, be considered for starch-based thickeners that would be insolubilized by the resin addition during the ageing process.

The introduction of completely aqueous pigment systems based on certain acrylic-resin dispersions compatible with thermosetting resins made practical the vast potentiality of simultaneous printing-and-finishing techniques. The impact of chemical finishing on printing as well as on dyeing technology is destined to further stimulate technology that had long remained stagnant.

Applications of thermoplastic dispersions suitable for binding pigments and yet compatible with thermosets have already been accepted in dyeing to give stabilization, creaseproofing, and washfast pastel shades on light fabrics.

What To Avoid in Drying

The thoroughly scoured fabrics should be dried at 180 to 220° F. in order to avoid any overdrying that tends to render the cellulose fiber somewhat hydrophobic and less apt to absorb the resin solution quickly during the subsequent padding operation. Conditioning the fabric by cooling and skying after drying is advisable.

Avoidance of excessive tension on the fabric will allow it to relax sufficiently to avoid stresses that otherwise interfere with good wrinkle recovery and physical properties.

Because of the American method of processing cotton fabrics in rope form under much strain, it is difficult to eliminate the stresses and tensions to which the fibers and fabrics are subjected. On the Continent, pin tenters are more common and the problems of stress are greatly reduced. Some compromises have been made in the U. S. by relaxed drying after a resin treatment.

Fabric stress can cause loss in fiber properties, as was pointed out by Gagliardi and Gruntfest (18) in a study of resins applied to unspun cotton where it was shown that fiber resistance was considerably less than when the accumulated stresses of spinning, weav-

ing, bleaching, and dyeing had been added.

Swelling Treatments Help

Apart from the swelling of the cellulose that occurs with vat and naphthol dyes that require caustic soda, methods have been suggested of decrystallizing cotton by modifying some of the crystalline regions so that they become amorphous and give easy access to the resin solutions.

A method proposed by Susich (19) makes use of an anhydrous alkyl amine at low temperature followed by removal of the amine with chloroform and drying. The cotton fiber preserves its breaking strength and acquires increased extensibility, besides becoming more amorphous and swollen. This process has not yet had commercial application, nor have other methods of fiber swelling based on calcium thiocyanate, zinc chloride, or quaternary ammonium bases.

Mercerization is still the only commonly used pretreatment for cotton fabrics that are to be given a resin finish. Caustic soda, when applied by mercerizing, even under the least favorable conditions, as is the case for fabrics, imparts increased chemical reactivity to the cellulose for thermoreactant resin solutions.

After mercerization, the fiber acquires a rounder cross section in direct ratio to the amount of tension applied. There is an increase in orientation of the fiber and at the same time an increase in fiber strength. The fiber, however, acquires a lower order of total crystallinity, with possibly a better distribution thereof. The dimensions of the crystallites are reduced, and there is a higher total amount of amorphous area. This greater amount of available space can be utilized to deposit larger amounts of dyes and resins.

There is also an increase in dye affinity, color value, and brightness that justifies mercerization in its own right. The greater chemical reactivity to resins makes the operation more desirable.

Crystallinity vs. Shrinkage

The shrinkage of the fiber is in reverse order to the degree of tension during treatment. Without any tension, the cotton fiber shrinkage is 20% in length, while the diameter increases 75 to 80%. When no tension is present, there is a decrease in crystalline areas of almost 30%, which renders the fiber far more suitable for resin treatment. It is, of course, necessary to compromise between decreased crystallinity and the amount of shrinkage in length of the fabric.

At times it is advantageous to apply a second mercerization after the resin has been applied and cured. In this manner, a second swelling takes place that allows an increase in fiber physical properties for fabrics where excessive resin was used and embrittlement has occurred.

Treatments of fabrics with chemical reagents to modify fiber reactivity for resin application have been suggested but are not yet used as part of the practical applications.

Modification of the —OH groups by conversion to ester or ether groups can be achieved, for example, by partial carboxymethylation of the cellulose. The resultant effect is similar to the swelling imparted by mercerization and gives a lowering of the total fiber crystallinity. The drawback of such a procedure consists in the decrease in fiber affinity for substantive dyestuffs, including the vat and sulfur types.

The field for research on this subject is vast, and many methods based on animalization of cellulose with amines and amides (20) that are able to impart to cotton the property of dyeing with acid dyes or to react with aldehydes have been proposed.

Auxiliary Chemicals

How Wetting Agents Help

Wetting agents of the nonionic type are often added to the resin-treating solution to facilitate the saturation and diffusibility of the resins into the fiber, particularly when the finishing is carried out at low temperature on poorly absorbent fabrics. At times, it is advisable to pretreat the fabric by drying into it a rewetting agent that greatly aids the subsequent absorbency of the cloth.

Rewetting agents differ from wetting agents mainly in their characteristic of redissolving instantaneously even when dried into the fabric and thus rendering the fabric receptive to quick and thorough pickup of solution. They have the drawback of being anionic and therefore incompatible with the current cationic softening agents used in resin baths. New cationic softeners possessing wetting and rewetting properties have just been announced and await plant investigation.

The cross-linking of the cellulose chains by reactant resins and the formation of three-dimensional polymers inside the cellulose impart a rigidity to the cotton fiber that greatly reduces the physical properties in relation to wear, tear, and abrasion resistance. The change is attributed to a loss in extensibility of the treated portions and the subsequent lowering of internal fiber movement. The difference in rigidity is usually directly proportional to the degree of crease-resistant effect obtained; and it varies little among the types of urea formaldehyde, melamine formaldehyde, or reactant resin used.

Why Softeners Are Needed

The reasons for the improvement in tear strength of resin-treated cotton fabrics by the addition of a textile softening agent have been given much study and warrant clarification concerning the mechanism by which the improvement comes about.

The concept of plasticization as understood in the chemistry of plastic chemicals is not the same as what occurs when a softener and a thermosetting aminoaldehyde resin are applied to cotton. In the former field, the function of a plasticizer is to render the plastic more readily fusible, softer, flexible, extensible, and more resistant to water. A plasticizer is therefore any material able to lower the intermolecular forces of attraction of the plastic substance.

If the same principle of applying external plasticizers is used for textile resins, the results are not satisfactory. Suitable internal plasticizers for amino-formaldehyde resins are not available, nor are there any materials offered that can penetrate the fiber and plasticize the resin therein.

The softeners in use today that give improved tear strength do so merely by imparting a more-even distribution of the forces of strain in the fiber. It is evident that textile softeners that possess large, bulky, fatty hydrophobes cannot possibly penetrate much beyond the interstices of the fiber. The final effect is one of lubrication and not true plasticization.

The textile industry awaits the application of plasticizers or of internally plasticized resin. Meanwhile, it has been apparent for some time that a resinous structure of an elastic nature would impart reversible movement to the cellulose chains, without rigidity and loss of physical properties.

A compromise advance in that field has been presented by Abrams and

Sherwood (21), who applied thermoplastic resins and synthetic latices in conjunction with reactant resins to obtain remarkably high crease recovery at high levels of resin content without much loss in physical properties.

What Softeners Should Do

One of the necessary requisites of a good softener is that of substantivity so that it will remain effective after the fabric is washed and if possible during the life of the garment. Zelan answers all these requirements; but unfortunately, even at the necessary low concentration of 1%, it imparts some water repellency that often interferes with the subsequent processing. The selection of good cationics is rather difficult because it involves the following requirements:

1. **Tear improvement**
2. **Durability to washing**
3. **No yellowing of Sanforized fabrics**
4. **No staining of white grounds**
5. **No impairment of dyeings and lightfastness**
6. **No interference with resin solution, builders, and catalysts**
7. **No decomposition products to retard catalysis in curing**

There are satisfactory types on the U. S. market that answer these requirements for practical use.

An anionic type able to react with formaldehyde to give durability is available as Cirrasol XL, a mixture of stearamide and sodium oleyl sulfate that is considered to form a methylol derivative of stearamide that can react to cellulose and become washfast:

$$RCO_2NH + CH_2O + Cell - OH \rightarrow Cell\ O - CH_2 - HN - OCR + H_2O$$

An emulsified methylol stearamide product is available in Europe as Persistol WS, and similar types have appeared in the U. S. They possess some water repellency and hinder processing Sanforized fabrics.

Finishes May Be Varied

The type of hand required on cotton fabrics is subject to many factors of end use, weight, feel, and style. It is thus imperative to have available builders that can impart stiffness; and if used in conjunction with softeners, they must also impart a full, heavy hand. Several suitable materials are on the market that possess excellent washfastness when used in conjunction with formaldehyde-containing resins.

Polyvinyl alcohol, carboxymethyl cellulose, hydroxyethyl cellulose, and starch ethers derived from ethylene oxide will impart durable effects as hand builders in the presence of creaseproofing resins. They can be used to obtain the complete gamut required in cotton finishing, including glazing, plissé, and embossing.

Catalysts are an integral part of the resin treatment; and their selection depends upon the choice of resin, bath life, and curing temperature and time.

Application of Crease-Resistant Resin

The application of creaseproofing resins to cotton can be carried out with some modification on the standard cotton-finishing machinery designed for durable-finishing techniques.

Padding

The resins do not possess substantivity for cellulosic fiber and must be padded on the thoroughly clean and dried fabrics at high expression in order to obtain good penetration with a minimum of excess liquid that could otherwise cause surface effects or migration on subsequent drying.

Quetsches and low-pressure mangles are not satisfactory. Hydraulic padders give best results because of their controlled pressure. A squeeze to give a pickup of 65 to 75% is considered satisfactory and allows the liquid to penetrate the fiber thoroughly.

Bath pickups beyond 85% give harsh fabrics because of the resin polymer formed on the fabric surface wherever melamine and urea-formaldehyde resins are used. The surface resin can occur whenever the absorbency of the fabric is low and the liquid does not penetrate the fiber. This drawback can produce flaky or dusty finishes and can usually be traced to poorly prepared fabric or the presence of metallic soaps, chrome complexes, or excessive dyestuff.

The pickup of 65 to 75% is misleading if the fabric is poorly absorbent. The distribution of the resin in the fiber is the main factor.

Penetration can be increased by adding wetting agents or, as a last resort, by pretreating the fabrics with rewetting agents. The necessity of using cationic softeners as part of the process precludes the use of anionic penetrants; only nonionics should be used.

Three-Bowl Padders Preferred

Three-bowl padders that permit a second dip and squeeze are superior to the two-bowl type and give better diffusion of the resin solution into fiber pores. The fabric should enter the solution at an evenly conditioned state; the regain and the manner of drying can account for many of the inconsistencies of resin finishing. The fabric should enter the padding solution at minimum or at least even tension, and the solution should be below 80° F. for monomeric resins and below 110° F. for the stable reactant types.

There is no preferential absorption of the resin from the water solution; however, there is often a higher pickup by the filling threads that are often of lower twists and do not contain sizes.

A typical resin solution is prepared as follows:

Rhonite R-1 (50%)	**80 lbs.**
Softener R (cationic)	**8 lbs.**
Triton X-100 (nonionic)	**¼ lb.**
Catalyst G-8	**4 lbs.**
	100 gals.

The liquid Rhonite is simply poured into the lukewarm water at 100° F. The softener is first dissolved and then added directly, followed by the nonionic penetrant and catalyst. Polyvinyl alcohol (about ½ lb.) previously dissolved in water or an acrylic resin dispersion such as Rhoplex WN-75 could be used to impart a full hand.

Drying

Drying often spells the success or failure of the resin application; and although there are various techniques of application, there is a great deal of question concerning the method of drying to obtain best stabilization and the most suitable creaseproofing at a given finish length and width.

The different approaches to the mechanical factors of maintaining width and length have led to a different technique on each side of the Atlantic.

European mills, geared to high-quality, low-speed production, have concentrated on the overfeed pin tenter that allows the fabric to dry in a relaxed position. In this drying method, the fabric is not subjected to stresses and tensions that would cause it to change dimensions in washing.

In the U. S., the need for high-speed production has led to wide use of the clip tenter, which stretches the fabric more than the pin tenter.

A compromise between the European and U. S. systems is now in use. In this method, the fabric is first dried on a loop dryer to sufficient moisture content to give maximum re-

laxation and then drying is completed on a tenter frame to remove wrinkles and folds that would otherwise occur if the drying had been prolonged excessively on the loop dryer.

The drying should be carried out at a temperature well below that of curing so that no polymerization begins until the fabric is thoroughly dry. A temperature of 180° F. during drying eliminates all danger of resin migration and any catalysis that would otherwise occur.

Exhaust Fumes

It is important to have sufficient exhaustion of air from the tenter frame to avoid excessive accumulation of moisture and to curtail odor development, particularly in the presence of ammonium-salt catalysts.

During the initial drying phase, the pH conditions begin to change and formaldehyde is evolved as the first resin reactions commence. Any accumulation of formaldehyde, particularly in a damp atmosphere, raises the possibility of odor formation. A thorough removal of the fumes, rather than the addition of urea as a formaldehyde scavenger, is advisable.

The desire to speed up production often leads to odor difficulties and consequently low-quality goods.

As drying proceeds, the capillary system of the fiber is influenced by the tendency of the water in the fabric to evaporate before the water at the surface of the fabric. This tendency will cause migration from the capillaries.

The Dungler system of drying uses a new principle that transforms the moisture in the cloth to steam before it reaches the surface and thus avoids all dangers of resin migration. Similar systems based on superheated steam have recently been made available in the U. S. by the introduction of the Vapojet dryer.

Curing

Once the cloth leaves the dryer it should pass directly to the curing unit in order to take advantage of the heat in the fiber. If immediate curing is not possible, it is advisable not to leave the fabric on rolls in a hot state that would allow curing to initiate and give uneven results. A cold cylinder, a jet of cold air, or other cooling device is easy to install and will avoid any possibility of unevenly cured fabrics. Pleating into a box is more satisfactory than batching on rolls.

The curing operation, when conducted under controlled conditions, should take about 3 mins. at 300° F. or 1 min. at 360° F. The time-temperature reverse ratio of reaction makes it possible to adapt the operation to production speeds, length of curing unit, and heating facilities. A minimum low temperature of 260° F. for 10 mins. will be found practical. Resins will cure at much lower temperatures, but the heating periods are then prolonged to hours or even days.

The fabric should be cured in a completely relaxed state; therefore, slack dryers of the loop type are generally used. The width and length of the fabrics during this thermosetting operation determine the final stabilization of the fabric. The conditions of cure need to be controlled so that the circulation of air in the curer is maintained and all vapors are quickly exhausted.

Prolonged contact of the cloth with excessive temperature can lead to thermal decomposition of the resin and to the development of methylamine odors. The unit should be constructed in a manner to give immediate curtailment of heat the moment a breakdown occurs in the system.

Recent improvements in infrared drying techniques such as the Sill units can be utilized to partially or fully cure synthetic resins.

Afterwash To Stop Reactions

All resin-treated fabrics should be given a thorough alkaline afterwash to remove any unreacted chemicals and catalysts that would otherwise be present and continue to react over long periods of storage.

This operation can be performed in continuous rope or open-width form in tandem with the cure. A satisfactory alkaline contact will free any trimethylamine present so that it will be readily removed by several vigorous hot rinses. A satisfactory afterwash can be based on:

4 lbs. TSPP
1 lb. synthetic detergent
per 100 gals. at 120° F.

The goods, if in open form, enter the detergent solution and need to remain a sufficient length of time for full saturation. The bath solution should be fed from a stock solution according to the alkali consumption by the acid catalyst and the weight and speed of the cloth. Open washers or Williams units constitute ideal arrangements for the operation. Tensitrol units assure relaxed washing.

The fabric is later dried without tension and then given the Sanforized treatment if necessary to guarantee the perfect shrinkage control often required for cotton fabrics. The resin itself imparts dimensional stabilization but not always sufficiently to guarantee 1% residual shrinkages.

Special Finishing Effects

Chlorine Retention

Control of Operations

The creaseproofing process can be, and should be, very effectively controlled on a laboratory basis in order to assure that all operations are geared to the production of merchandise of consistently high quality.

The resin content of the cloth determines the degree of creaseproofing effect. For resin-reactant types that do not form polymers, the quantity required for good stabilization and crush resistance is 4 to 5% fixed resin. For melamine-formaldehyde or urea-formaldehyde pastes, the required amount is 8 to 10%. Any quantity

over these figures gives better wrinkle recovery at a proportionately greater loss in tear strength.

The use of durable softeners and plasticizers could lead to better physical properties at higher crease recovery, but at present the best cationics do not permit the use of higher amounts of resin than those indicated. The resin content of 4 to 5% solids for a reactant type should be considered in terms of fixed resins after washing and not as total resin applied.

The importance of resin fixation cannot be overemphasized because the entire effect of crease recovery and stabilization depends on the actual resin fixation. The hand of the fabric may be satisfactory and the initial creaseproofing may appear to be good, but no durability of effect is obtainable without a high percentage of resin reactively fixed to the fiber.

Table V shows a typical amount of resin fixed on the fiber and located by laboratory evaluation. Resin fixation should be over 80% to be satisfactory. The curing operation, the saturation of the cloth, and the amount of catalyst should be checked if the 80% fixation level is not achieved. The absorbency of fabrics is often decreased by impurities such as oxidizing agents, dyestuffs, and lime soaps that remain on the fabric prior to resin-treating.

Efficiency of Crease Recovery

For cotton fabrics, a good crease-resisting rating is considered to be about 110 to 125° when measured according to angle of recovery on the Shirley tester. Higher angles are accompanied by a much too drastic loss in tear strength of the fabrics.

Table VI shows the relationship between the various accepted standard methods of evaluation. The Tootal Broadhurst Lee method is probably best known for rayon fabrics, but it is gradually being replaced by the more rapid and quite accurate methods of angle determination.

The T.B.L. method gives the distance between two ends of a sample that has been creased. The percentage is the relationship of the angle to 180°. The Shirley or Monsanto angles differ little and are merely obtained by two slightly different methods. (See also AATCC Test Methods in the Year Book.)

The durability of the fabric finish in terms of crease recovery and stabilization should be graded according to end-use requirements. Well-cured resin with a high degree of fixation on the fabric will meet all practical requirements provided the fabric has been given the Sanforized treatment after the resin application.

Tear and Abrasion

The relationship of tear and abrasion tests to actual wearing properties of the garments has never been satisfactorily established, and no laboratory machine has yet been selected for either tear or abrasion testing. All the machines available for use can be utilized, nevertheless, to evaluate the results if the following points are considered:

1. Tear-strength testers such as Trapezoid, Elmendorf, etc. can serve as a guide for the effect of various resin concentrations on each particular type of fabric.
2. The scale of evaluation by any given machine can be used as a basis for comparing results on different fabrics, but no real coordination with wearability of the garment can be assumed.
3. The different types of machines cannot be closely correlated to one another because they do not measure the identical factors of tear.
4. A decrease of 25 to 35% in the tear of a cotton fabric after the application of a resin finish is usual. In case of excessive loss in tear, it will be necessary to reduce the resin content or to add more softener.

Abrasion resistance follows the same pattern as tear. The Schiefer, Stoll, Tabor, and T.B.L. testers, etc. are all satisfactory for evaluating the effects of resin treatments on a particular fabric against the untreated but not to guarantee that the fabric will wear well on protracted use.

The abrasion resistance of cotton is so outstanding that even a substantial drop in this property does not detract from satisfactory wearability.

Tensile strength can be evaluated very reliably on the standard Scott testers. Little drop in this property is observed on resin application.

Chlorine Retention a Drawback

Nearly all the successful products applied to cotton fabrics to give acceptable creaseproofing finishes contain nitrogen in the molecule and therefore are apt to retain chlorine under certain conditions of application during chlorination or washing.

Urea-formaldehyde resins take up quantities of chlorine through the unblocked $-NH_2$ groups and then liberate it as HCl to give scorching and severe tendering during the hot ironing in laundering. Melamine-formaldehyde resins take up chlorine readily, but because of their basicity they protect the fabric from severe tendering. Unfortunately, they have the disadvantage of yellowing badly with chlorine and under no conditions should be used for white fabrics or printed patterns on white grounds.

The reactant resins, only recently developed, possess good resistance to chlorine; and if they are handled under standard U. S. laundry conditions, they show no yellowing of white or tendering of fabrics. They are still not entirely free of unblocked nitrogen and could conceivably cause damage if allowed to come into contact with exaggerated amounts of chlorine. No recorded case of chlorine damage that could be traced to regular laundry practice has been reported, although millions of yards of cloth treated with reactant resins have been consumed.

AATCC has studied the chlorine problem for many years, and the cotton finishers are familiar with the No. 4 wash test at 182° F. in the presence of soap, soda ash, and chlorine (0.01%). The laundry and soap industries use a similar test with chlorine for the evaluation at 160° F. of fluorescent optical bleaching agents that take the place of bluing.

AATCC has under survey a new test (Tentative 69-52) that was designed for rayon and is carried out at 80° F. It does not approach the severity of the treatments given cotton. Melamine resins catalyzed with magnesium chloride show no yellowing in this test because of the pro-

TABLE V

Reactant-Resin Content on Cotton Fabric

(Note: Melamine and U.F. resins require double these amounts)

Solids applied in padding	8.0(%)
Deposited on cloth (75% pickup)	6.0
Amount after curing	4.8
Amount after wash	4.5
Amount determined by acid extraction	4.0
% of cured resin fixed on fabric $\left(100 \times \frac{4.0}{4.8}\right)$	83.3

TABLE VI

T.B.L. Method	Shirley or Monsanto angle (in degrees)	Percentage relative to 180°
2.0 cm	60	33
2.2	67	37
2.4	74	41
2.6	81	45
2.8	89	49
3.0	97	54
3.2	106	59
3.4	116	65
3.6	128	71
3.8	144	80
4.0	180	100

tective action of the magnesium salt. At 100° F., the yellowing becomes severe; and at 110° F., there is no protection whatever.

The chlorine problem remains with us even though a solution has been offered under controlled conditions of chlorination for most garments that have been processed with reactant resins or for dark shades treated with melamine resins.

Unfortunately the urea-formaldehyde resins cost much less than the high-quality reactant and melamine types, and they are being used on fabrics not expected to come into contact with chlorine. Should trouble develop, the creaseproofing program will receive a sharp setback. Fortunately, new and far more stable resins that so far are successfully meeting all consumer demands and tests are already available.

Specialty Effects

In addition to the wrinkle-resistant fabrics that are so popular today, there are many specialty effects that account for a great portion of the success of the spectacular comeback of cotton in the last few years. These specialty finishes, obtained by mechanical means that are ingeniously used in conjunction with synthetic resins, constitute the bulk of the highly styled fabrics that have made cotton popular even in expensive garments.

One of these finishes, embossing, sparked the entire development of creaseproofing techniques on cotton, while the Everglaze process of Joseph Bancroft and Sons Co. pioneered mechanical finishes obtained with synthetic resins some years earlier.

At present, many varieties of fabric finishes can be produced by saturating the cloth with a resin solution, partially drying it to avoid catalysis, and then subjecting it to some specific mechanical operation to produce calendered, embossed, pleated, or plissé patterns. These operations are then followed by curing so that the effect will remain and become washfast.

The resins employed are the same as those for creaseproofing, bearing in mind that the reactant type does not form surface–resin polymers and therefore will not clog the Schreiner lines or the embossing rollers.

The hand of the fabric can be modified by incorporating softeners of the cationic type to assist in imparting fullness and good tear strength. Body and firmness of finish can be obtained by incorporating water-soluble polymers, polyvinyl, alcohol, and starch ethers able to react chemically with the formaldehyde in the resin to give durability.

How To Get the Effects

Durable glazed, embossed, and effects such as Schreiner and moiré finishes can be obtained by reacting a resin within the fiber after the mechanical effect has been applied. The durability of glazed or embossed patterns is extremely important, and the control of the operations is quite intricate. Reactant-type resins are particularly useful in these operations because of their high chemical stability during application and their outstanding durability. A delayed-action catalyst is advisable to avoid any initial cure of the resin prior to the application of the heated, high-pressure calender or the embossing cylinder.

The fabric is padded with the resin, dried to 10 to 15% moisture content, friction-calendered, Schreinered, moiréd or embossed, cured, washed, and finished. Patents are held by Joseph Bancroft and Sons Co.

A typical formulation is:

Rhonite R-1 (reactant-resin type)	80 lbs.
Softener R (cationic)	4 lbs.
Organic amine catalyst	4 lbs.
	100 gals.

Glazing effects of high luster are obtained by friction-calendering at 320 to 360° F. The Schreiner patterns can be made by using standard Schreiner calender rolls engraved at 200 to 240 lines per inch at the desired angle to give a high sheen. The temperature of the roll must be 300 to 350° F. Moiré is obtained in a similar manner. Embossed patterns require sets of male and female rolls at very high pressure.

Colored Embossed Patterns

This specialty finish is first embossed in the regular manner and dyed by running the cloth over a surface that transfers a thickened dyestuff solution solely to the raised portion of the pattern. This method is known as tip dyeing and has now been supplemented by valley or tulay dyeing that is accomplished directly during the embossing operation.

The difficulty of this latter process consists in applying dyestuffs or pigments from a thickened medium that must withstand the high heat of the top steel embossing roll, which must be kept at 400° F. The problem has been solved, and the results show a beautiful three-dimensional effect.

Many fabrics destined for embossed patterns are vat-dyed and then given a resin padding. New acrylic polymeric dispersions now make it possible to apply pigment colors with the resins to obtain simultaneous dyeing and finishing that is not possible in vat dyeing. The dyed fabrics can go directly to the embossing calender.

Pleated Patterns

There are two varieties of pleated fabrics, warp effects and filling effects. In either case, a resin is applied in the standard manner and the pleats are obtained by running the fabric through poteyes in a damp state to give a peculiar haphazard pattern that is very pleasing. The filling effects are more popular because of their precisely textured outlines, which are obtained by folding the fabric in regular pleats as it enters the calenders.

Plisse Patterns

Plissé can be produced by printing a thickened caustic-soda paste from a regular plissé engraved roller to give a local effect that will cause a pucker. The unprinted portion does not pucker; and because of the presence of the stabilizing resin, the fabric dimensions in the unprinted areas are maintained far better than in the regular plissé. The results are greater contrast between the two areas, more pronounced plissé, more permanent plissé, and crush resistant and stabilization combined with plissé.

Excellent plissé effects have been obtained on fabrics having a construction of 80x80 and higher, indicating that a new range of fabrics which heretofore were impossible to plissé will be available by the use of resin pretreatment. In addition, fabrics such as denims, napped fabrics, and novelty weaves can now be successfully plisséd.

Another important advantage can be realized from this process in that the plisséd fabrics may be frame-dried at desired width to obtain in many cases greater width than by the older method. Widths greater by ½ to 1 in., together with increased yardage, have been obtained.

Combination Finishes

Color-fixing agents can be used in conjunction with the reactant resins

in one-bath applications. The resins alone will improve the washfastness of direct colors; and when they are used with color-fixing agents, a high degree of fastness can be obtained. The color-fixing agents are often acid in nature; and no added catalyst is ordinarily needed for the resin, although this depends on the choice of the fixative.

Water repellency can be obtained by incorporating either a durable or nondurable water repellent in the resin-finishing bath. Indications are that when durable agents of the cellulose-reacting type are used the catalyst may be omitted, since the water repellent provides the needed acidity. The amount of alkaline buffer is reduced and in some cases may be eliminated, since the resin provides a neutralizing action and serves to protect the fabric from acid damage.

Modification of hand and many other varied effects may be obtained by the use of the synthetic resins with other textile finishing materials such as starches and gums, natural and synthetic softeners, and the thermoplastic resins.

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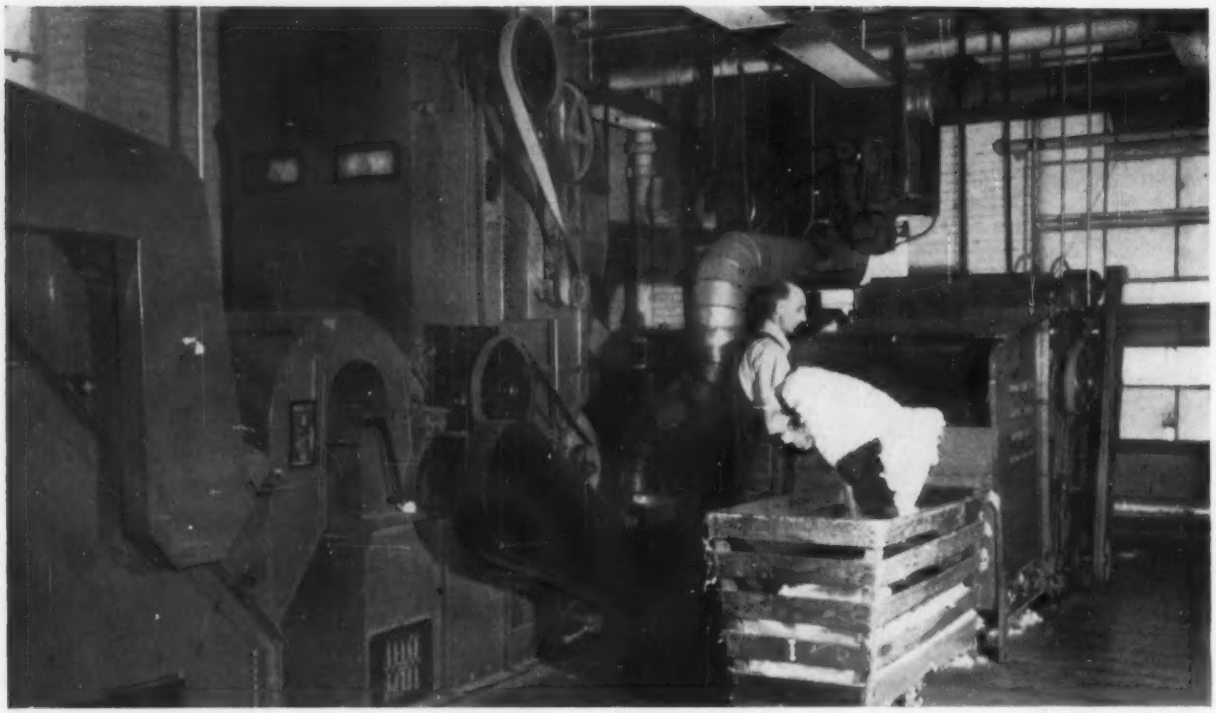


OPENING EQUIPMENT is set up in two lines, one at each end of the room. Each line is fed by six hoppers. Production is over 1,300 lbs. per hr. The vertical opener runs 550 rpm., and the No. 12 runs 450 to 500 rpm.

Linn's New OPENING ROOM

The opening room at Linn Mills Co., Landis, N. C., has been completely reorganized. Improvements include—

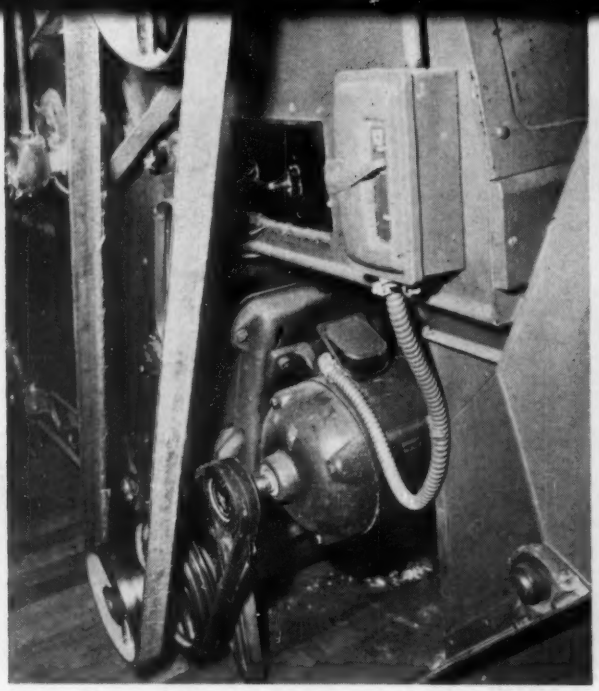
- **A mill-made pneumatic conveyor**
- **Elimination of one condenser**
- **Observation ports in machines**

By WILLIAM G. ASHMORE, Associate Editor, TEXTILE WORLD

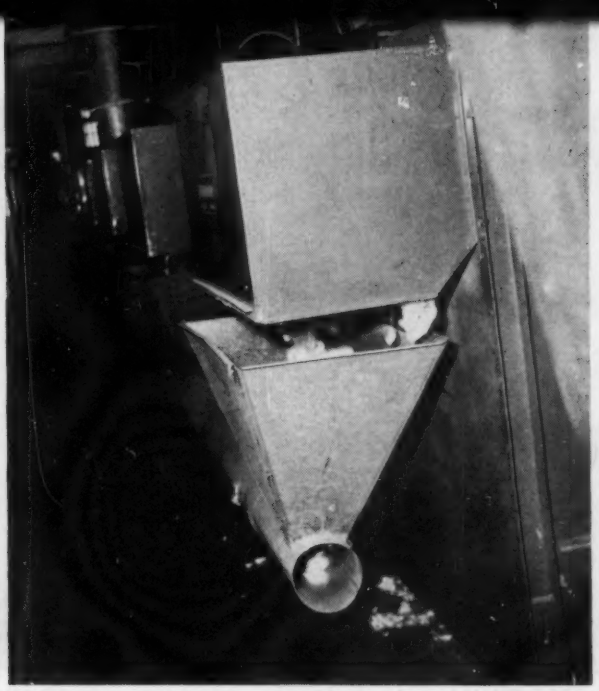
THE QUALITY of the combed and double-carded yarns made by Linn Mills Co., Landis, N. C., has been improved by revamping the opening room.

Opening equipment is located in a maple-floored room large enough to accommodate 120 bales of cotton laid down at one time; feeding is from 60 bales. Some of the equipment is new, some was rebuilt, and some was made in the mill shop. All machinery is in first-class operating condition.

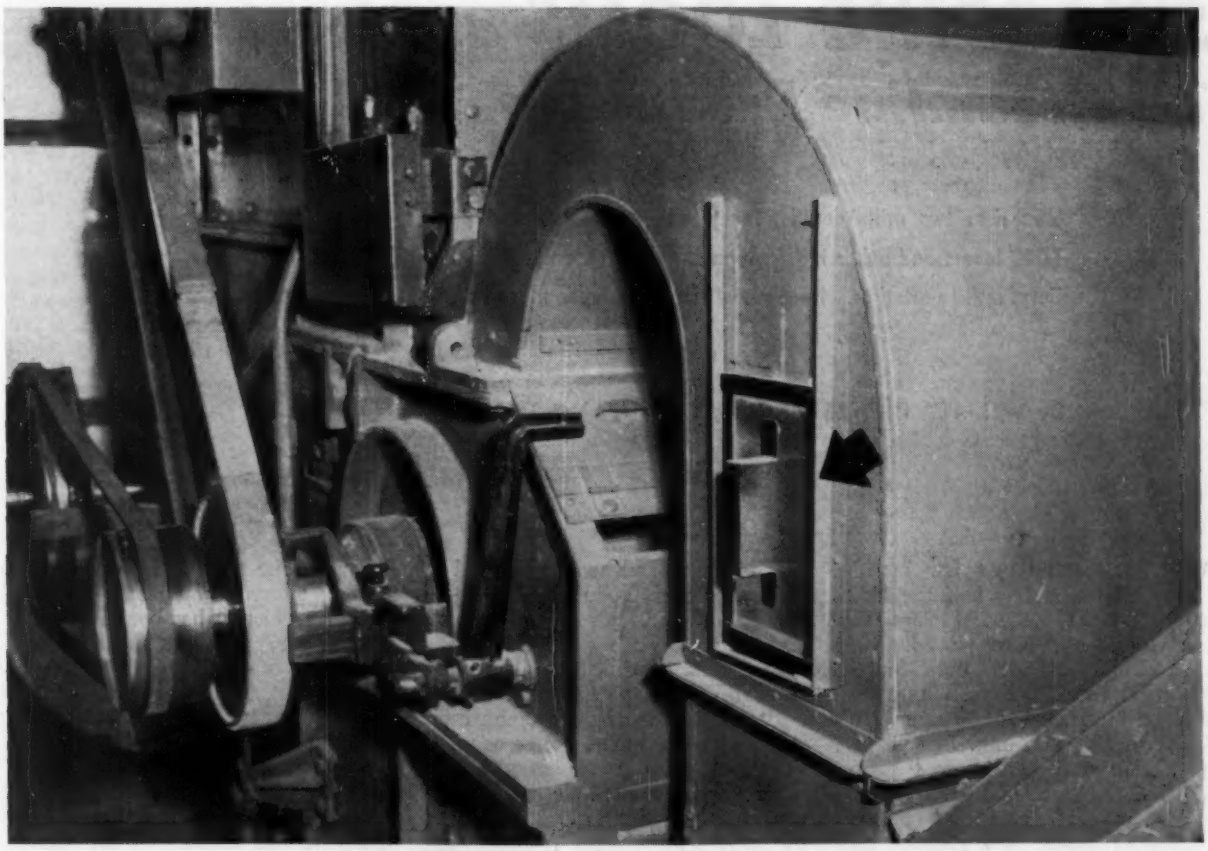
The organization of the machinery differs somewhat from that of the average mill, but settings and speeds are largely conventional.



EACH NO. 5 HOPPER is driven by a motor mounted under the discharge end of the machine. The arrangement permits individual control over the hopper, and cleaning is easier. In front of each hopper is a Centrif-Air Junior cleaner. Settings and speeds in this line of equipment are largely conventional.



A PNEUMATIC-CONVEYOR SYSTEM replaces the apron in front of the cleaners. This equipment, constructed by the mill, is fed through small hoppers built into a tapered pipe. The shape of the pipe and the size of the hopper openings equalize air pressure to assure even blending.



A CURVED DUCT between the No. 11-over-12 opener and the Superior cleaner takes the place of a No. 11 condenser. The beating action of the cleaner combined with air pressure throws the cotton through the passageway. A small Plexiglass window (arrow) makes it easy to spot chokes.

MOBILE CRANE is used to load looms on motor trucks and unload them at the Trion mill.

HOMEMADE DOLLIES under the loom feet let the looms be rolled easily to the weave room.

SWAPPING LOOMS at Riegel To Streamline Production

• So that two mills could concentrate production on specific fabrics, more than 1,000 looms and other mill equipment were recently moved from one Riegel Textile Corp. mill to another. Here's how the looms were moved and put back in production.

By **WILMER C. WESTBROOK,** Consulting Editor, TEXTILE WORLD

WITHIN the past few months, approximately half the looms at the Trion, Ga., Div. of Riegel Textile Corp. have been moved. More than 1,000 E-model and X-model looms 36 and 40 ins. wide have been shipped by truck to the corporation's Ware Shoals, S. C., mill. In exchange, the Trion mill has received almost 800 X-2, XD, and XP looms 44 and 50 ins. wide. In addition to the exchange of looms, 134 E-model and X-model looms have been relocated in the Trion mill. A hot-air slasher was also moved in the exchange.

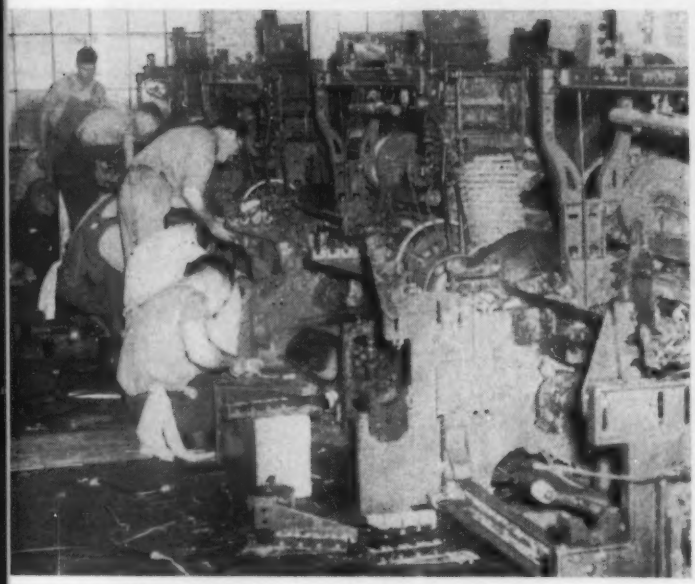
The looms have been exchanged to streamline cloth production in the two mills. Both mills are about the same size, and both are complete textile-manufacturing plants from opening through dyeing and finishing.

Before the exchange of looms, each mill had some looms better adapted to weave fabrics in production at the other plant. For two examples, (1) the Trion mill weaves Canton flannel for Riegel's glove plant at Greenville, Ala., and (2) the Ware Shoals mill furnishes cloth for the diaper- and pillow-case fabricating plant at Ware Shoals. (The fabricating plant may soon be moved to Johnston, S. C.) In emergencies, it has been necessary to send the gray goods made in one mill to the other mill for finishing.

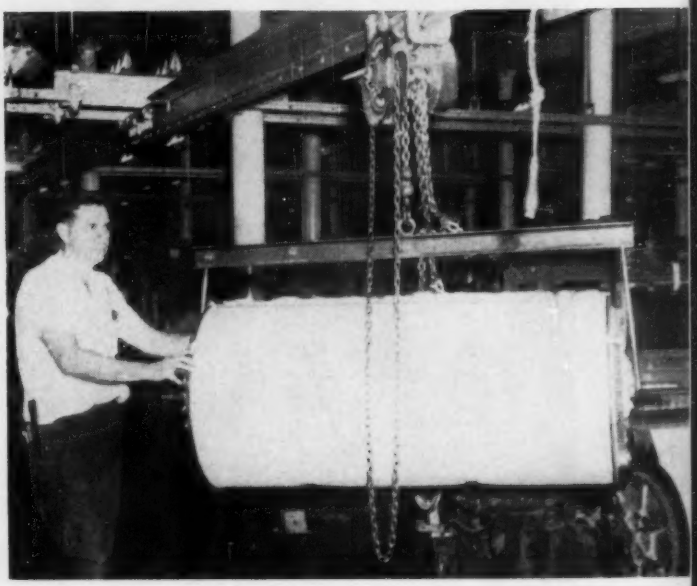
Why Looms Were Moved

Since these conditions existed in the two mills, management men decided to move all the looms suitable for weaving heavy fabrics such as suitings, draperies, and flannels to the Trion mill.

Lighter looms were moved to Ware Shoals to weave bag goods, print cloth,



CREWS OF MEN, including electricians and loomfixers, work together to locate the looms in the weave room.



MONORAIL AND HOIST were added to the weave room for beam handling on looms set close together.

bird's-eye diapers, and broadcloth.

The yarn-processing machinery and finishing equipment necessary to complete the fabrics were also exchanged between the two plants. For instance, the machinery included cards, spinning frames, quillers, a shearing machine, and an Uxbridge slasher.

The present machinery layout makes the Trion mill a versatile complete cloth-manufacturing mill. A wide range of fabrics can be woven from cotton and rayon fibers and from other synthetic fibers or blends. The patterns woven vary from plain two-harness weaves 30 ins. wide to 20-harness-dobby weaves 52 ins. wide.

Training Was a Big Problem

Fitting the 50-in. XD and XP looms into the weave room at Trion, which was originally designed for 40-in. looms, created several problems. The biggest was to lay the looms out for sufficient working space. This problem was partially solved by (1) installing a monorail system for handling loom yarn beams and (2) buying a portable tying-in machine to operate in the narrow alleys.

The 26-in. Barber-Colman portable tying-in machine bought for the job has two racks so that a warp can be put up on one rack while the machine is tying the warp on another loom. The machine operates at 300 knots per minute.

Another major problem that developed at the Trion mill was training employees. Most training centered on weavers and loomfixers. Before the exchange, only a few looms at the mill were equipped with dobbies. As a result, approximately 70 weavers and 40 loomfixers had to be trained in a few months to work on looms and fabrics radically different from those handled in the past.

Several capable loom men were sent to the Trion mill from the Ware Shoals mill to help train the loomfixers. The entire change-over of looms was completed without having to hire a loomfixer, and only a few weavers had to be replaced.

Moving Looms Was Easy

Moving the looms in and out of the mill was simplified by using dollies made in the mill machine shop.

The looms were loaded on trucks and unloaded outside the mill with a mobile crane, but some of the work had to be done with lift trucks. To load a loom with the crane, a chain was hooked around the bottom girders of the loom at the four corners. Then the crane lifted the loom to a flat-bed motor truck. When a loom was unloaded from a motor truck, it was set on the shop-made dollies and was ready to be rolled to the weave room.

The flat-bed motor trucks hauled nine 40-in. looms or six 50-in. looms each trip. A trip between the two mills was made in about 8 hrs. A total of approximately 100,000 miles was traveled by the trucks in moving the looms and auxiliary equipment.

All the looms at the Trion mill are set on mounting pads. More than 4,000 pads were required for the looms installed and relocated.

Looms for Specific Fabrics

The 50-in. XD looms have all-metal yarn beams with 28-in. heads. To provide more aisle space, these looms are being equipped with specially designed yarn-beam bearings and the back loom girders are being lowered so the beams are closer to the floor.

The front alleys (weavers' alleys) for the 50-in. looms are 18 ins. wide. The back alleys (warp alleys) are 28 ins. wide. The clearance between the looms at the ends is 17 ins. between lay ends.

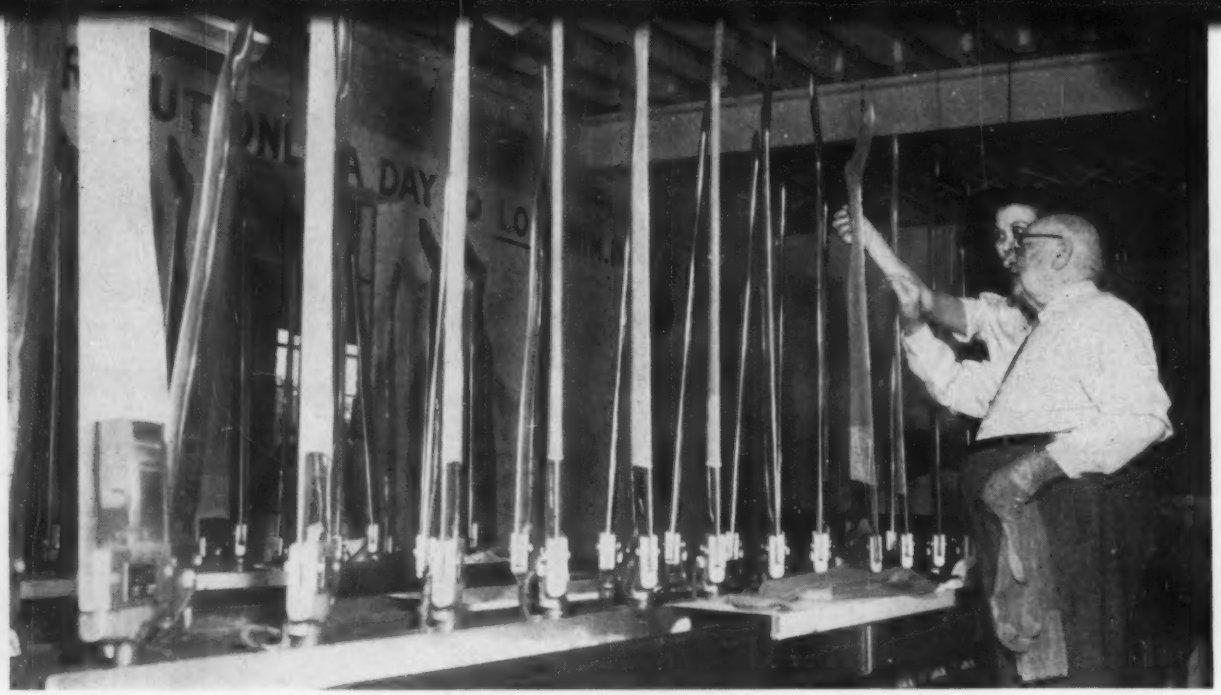
The 50-in. looms have 20-harness, single-index, double-lift dobbies of 28/32-in. gauge. They have Bartlett let-offs and center-fork filling stop motions.

The XD loom take-up is the low-roll take-up with the silk-type ratchet pick wheel.

The 50-in. XP looms have high-roll worm take-up motions.

All 50-in. looms operate at 162 ppm.

The 200 44-in. X-2 looms at Trion received from Ware Shoals had been weaving bird's-eye cloth. Now the looms are being equipped with larger shuttles and other accessories to fit them for weaving suitings. There were already 524 of these looms at Trion weaving Type #4 twills, shirting twills, and poplins. These looms operate at 182 ppm.



PREBOARDERS are trained to look for faults. Six stockings are removed from the forms at one time.

Smooth Work Flow Helps Produce GUARANTEED HOSIERY

• Highly skilled operators, pleasant working conditions, and efficient organization help this new South Carolina finishing plant turn out a guaranteed product

By **JAMES H. BLORE,** Associate Editor, TEXTILE WORLD

UNION DYE & FINISHING WORKS, INC., Union, S. C., moved into its new home in June, 1955. The new one-story building has lots of room to move around in, and the fifty workers in the plant turn out a product that flows smoothly through the mill with little supervision. One line of full-fashioned stockings is guaranteed for 30 days, and less than 0.25% are returned to the mill.

Equipment is laid out in the finishing room so that the goods enter one end and zig-zag down the room to reduce handling to a minimum. The same ticket travels on the tray with the goods so that there are seldom mix-ups, and operators help themselves to work from the previous process.

The ticket is made out in triplicate by the superintendent as a dye order. The dyer retains one copy and sends the two others with the goods. The second copy is retained by the transfer operator.

Stockings Are Kept Moist

When the stockings have been dyed and extracted, they are placed in metal containers to await preboarding. A lid on the container helps keep the stockings moist to make a better boarding job.

Rubber bands of different colors are tied around the dyebag to identify the size. The two tickets are placed on the top of the container.

The boarders take special care to keep the seams on the edge of the form, and the stockings are not stretched when they are drawn down on the form. Six stockings

FINISHED HOSIERY is packaged in transparent envelopes. A stiff card helps make a neat package.

PAIRING AND INSPECTING are done on cloth-covered tables to prevent pull threads and irregulars.

are removed from the machine at one time and laid on the tray at the front of the machine. Six stockings are easier to handle than 12 stockings, and they are kept neater.

The tips of the forms are interchangeable for different sizes. Each form is cleaned down at the start of every shift with a cloth soaked with Clena-Form to remove impurities that stick to the form and cause pull threads. Each boarder processes about 140 doz. stockings daily, and she is trained to look for faults and remove any defective stockings.

There are ten inspectors who also pair and size each stocking. The inspecting tables are covered with cloth to prevent pull threads, and the stocking length is marked on the cloth. Stocking lengths up to 36 ins. are sorted out.

All defects, no matter how minor, are removed. Defective stockings are repaired by two menders. The inspectors process up to 100 doz. each day. Their work is spot-checked by the supervisor.

After a label has been transferred to one welt in each pair according to the instructions on the dyehouse ticket, the goods are packed in tissue or transparent envelopes.

CONTINUED ON PAGE 153

DETAILS such as size, style, and color are stamped on the boxes, which contain ¼, ½, or 1 doz. stockings.

Union Dye & Finishing Works, Inc.

Date 10/5/55 , Dye Order

	Size Assortment						
Lot Number 1016	8½	9	9½	10	10½	11	
Style 26E		27	30	12			
Color Beige	Special Instructions to Pairers:						Measured:
Customer							

Welt Transfer

Folders Tissue Envelope ✓ Band Box

Shipping Instructions: Style Number on Box

To

Via

Value

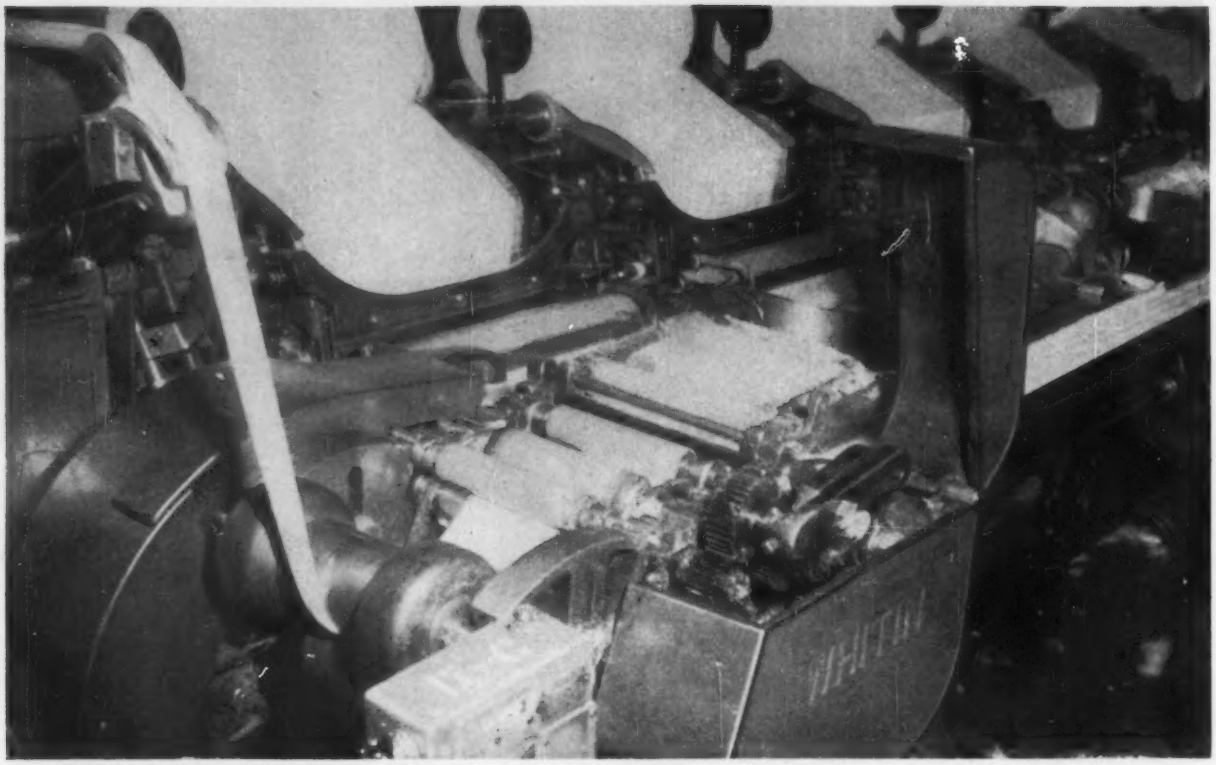
Customer No.

Order No.

Size Assortment to Customer	8½	9	9½	10	10½	11	

Special Instructions:

ORDER FORMS travel through all processes with the goods. The dyer and the transfer operator retain copies.



ONE LARGE ROLL was substituted for the two top middle rolls on the combers. Variation dropped from 60% to as low as 25%.

YARN EVENNESS
Increased 10% at Dunn

Machinery changes and modernization, from combing through twisting, have resulted in better-quality combed yarn at the Dunn Plant of Botany Mills, Inc., Gastonia, N. C. Improvements include—

- **Three-over-four combing and drawing**
- **New drafting system on spinning**
- **Creels removed from winders**

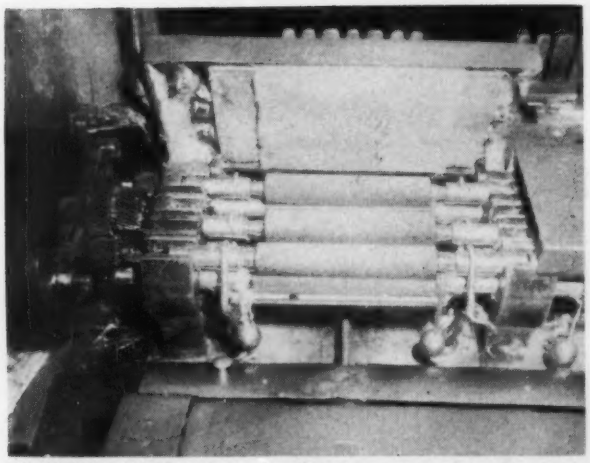
By WILLIAM G. ASHMORE, Associate Editor, TEXTILE WORLD

MACHINERY IMPROVEMENTS have increased production, reduced costs, and improved quality of yarn at the Dunn Plant of Botany Mills, Inc., Gastonia, N. C.

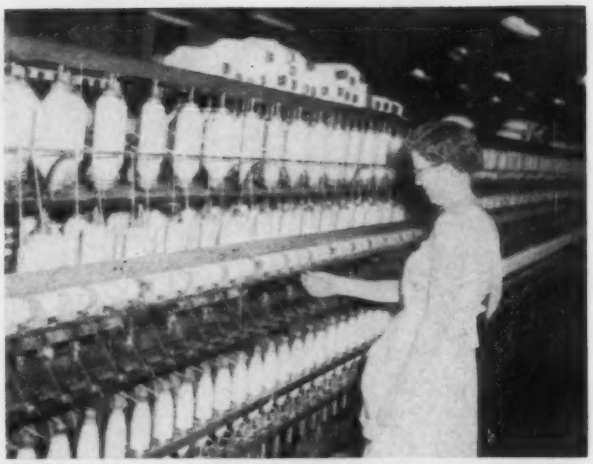
Evenness has been increased 5 to 10% in the combing department by changing the four-over-four drafting to three-over-four. The two middle top rolls on the combers were replaced with a single large roll, and changes in gearing were made.

A 615-grain lap, made from 1 7/16-in. staple and containing 17% noils, is fed into the comber to produce a 55-grain sliver. Total draft is 54.3. The 2¾-in. calender roll runs at 129 rpm. In 8 hrs., 17.7 hanks are produced at 100% efficiency. Actual efficiency is 98%. The back roll is set at 1¾ ins.; no other setting is required.

In converting the drawing frames from four-over-four to three-over-four drafting, the two middle top rolls

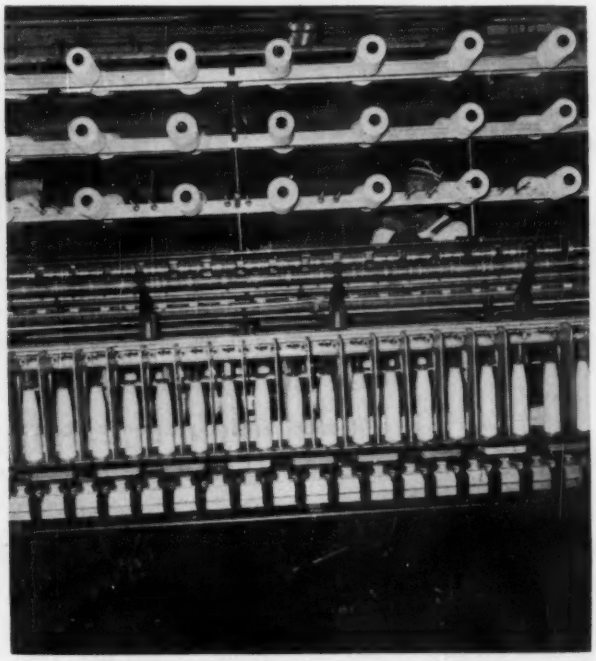


VARIATION IN DRAWING was reduced from 40% to less than 20% when three-over-four drawing was installed.



ENDS DOWN were reduced more than 5% and evenness was improved when the spinning frames were modernized.

CLEANING TIME was reduced 50% by taking the creels off these winders. Winding is from cheese to cone.



LARGE-PACKAGE, flexible-gauge twisting has increased production and reduced costs.

were replaced with a single large top roll. The second bottom roll is smooth.

A 55-grain sliver, six-ends-up, is fed into the drawing frame; a 59-grain sliver is delivered. Draft is 5.59, front-roll speed is 280 rpm., and production is 15 lbs. per hr. The only setting required is 1¾ ins. for the back roll. A new gearing arrangement was necessary.

Evenness Up, Breaks Down

Break and evenness in the spinning department have improved 10% on the 72 Whitin Model A frames that are being changed over from the Roth to the Casablancas system. The modernized frames are equipped with 2-in. rings and have a 2½-in. gauge. Also, 18 new 300-spindle Whitin frames have been added. These frames have 3½-in. gauge, 2-in. rings, 9-in. traverse, and the Casablancas drafting system.

Some of the converted spinning is running on 24s yarn. Hank roving is 2.50; draft, 19.2; turns per inch, 15.6; twist constant, 114; spindle speed, 8,175 rpm.; front-roll speed, 167 rpm.

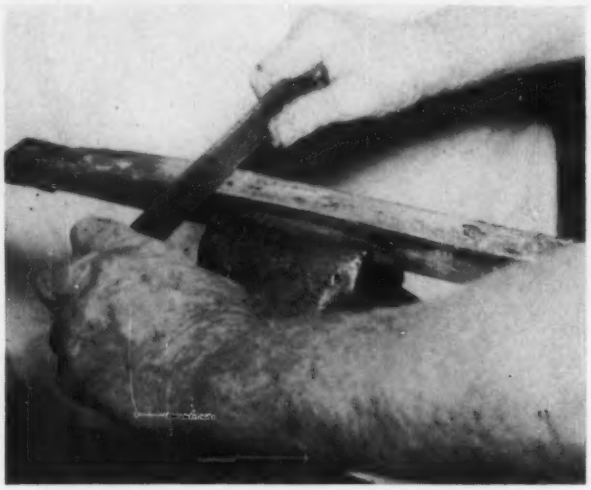
The new frames are spinning 38s yarn from 1⅛-in. cotton. Hank roving is 2.50; draft, 30; spindle speed, 8,950; front-roll speed, 132 rpm.

In the winding department, removal of the creels from the Roto-Coners reduced cleaning time by more than 50%. This change permits a single operator, running 150 spindles, to wind 1,000 lbs. of 30s to 50s single yarn in 8 hrs. Formerly, an operator winding these numbers could produce only 350 lbs. in 8 hrs.

A new Medley twister has been installed that puts 550% more yarn on the package than the other twisters now in use.

The air in the spinning, winding, and twisting departments is cleaned electrostatically by the Trion air-washing system.

REMOVE FACING by placing the binder in a vise. Pull off the facing with the hands or pliers.



REMOVE OLD GLUE with a scrape. Be careful not to scrape off any wood surface to change the shape.

How To Get the Most From Your LOOM BINDERS

First cost and ease in repairing loom binders are not the most important considerations. Think of the end results in repairing binders, and you'll—

- **Get long, trouble-free service**
- **Reduce repairing time and costs**
- **Cut loom downtime for replacements**

By WILMER C. WESTBROOK, Consulting Editor, TEXTILE WORLD

LOOM EFFICIENCY and cloth quality depend to a great extent on good box binders. Binders also affect the service life of shuttles, pickers, checkstraps, and other loom parts.

Binder service is severe; a binder receives and holds the shuttle up to 50,000 times every 8-hr. day. But if a binder is covered, installed, and adjusted correctly, it will give several months of satisfactory service with little care.

The binder itself does not wear out because all its working parts can be replaced. It is attached to the loom with an eccentric bushing and bolt at one end; the protector-rod-dagger finger holds it at the other end; the bushing shim, dagger-finger shim, and leather facing can all be replaced.

When one of the binder parts becomes worn, the binder should be removed from the loom and reconditioned. It's especially important to have binders in good condition when a new shuttle is put in a loom.

Let One Man Do the Work

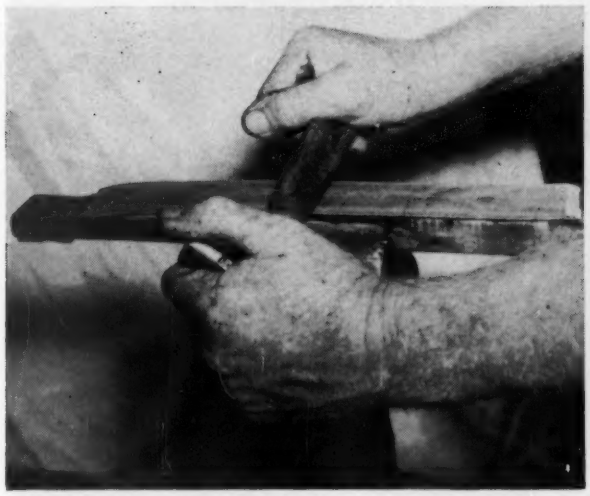
In some mills, each loomfixer repairs the binders on his own section. But this work can be done better and cheaper by a man trained to do the work. He should be set up in a shop fully equipped with the proper tools. But no matter who repairs the binders, the work should be done right.

The old leather facing should be removed without damaging the binder. To remove the facing: (1) place the binder in a vise; (2) remove the nails, tacks, or pegs; and (3) peel off the strip of leather with the fingers or pliers.

Then scrape the binder surface to remove old glue and leather residue. Do not scrape off any wood so that the shape of the binder is changed; that will ruin the binder; but obtain a clean surface. The binder surface is curved to provide as much contact as possible between the binder and the shuttle. If this contour is changed, the holding power of the binder is lessened.

Proper Tools and Methods

After the old leather facing has been removed, clean and inspect the binder. If it has cracks or other weakening defects, discard it and get a new one from the stock room. If the binder surface is good, examine the bushing shim and put in a new one if the shim is worn. But be careful; many good binders are split and ruined when the wrong tools and methods are used to remove and replace the shim.



NEW FACING is put on after the glue on the leather and wood has become tacky. Press the leather down firmly.

TRIM EDGES of the new facing after the glue is dry. Then bevel both ends of the facing for ¼ in.

To replace the shim correctly: (1) place the binder over the partly opened jaws of a vise so that the binder rests firmly on the vise and the shim has room to do down through the open jaws, (2) place the new shim directly over the old one, (3) hold a block of soft wood over the top of the new shim, and (4) tap the block of wood gently with a hammer to drive the old shim out and the new one in at the same time.

If the shim is compressed by fitting in the binder too closely or if a burr is formed on either end, ream out the shim with a small rat-tail file. The bushing should fit snugly in the shim but should turn freely without binding.

Use Metal Reinforcement

Binders with a metal reinforcing strip around the bushing end last longer than plain wood binders. The metal also protects the binder against splitting when the shim is inserted. The metal strip should be repaired if it is loose or broken.

The leather facing for binders can be bought from belting manufacturers cut to the exact size, or the facing can be cut at the mill from slab leather. Slab leather is usually cheaper; but it requires more labor, and scrap leather is left after the slab is cut. However, much of the scrap can be used for shims and lay-end straps.

Some loomfixers prefer a hard, glossy finish for binder facing; others want a soft, buffed finish. Both finishes have advantages and disadvantages. The hard finish lasts longer and requires less care; the soft leather is easier to apply and gives better braking friction to the shuttle. But whichever leather is used, always use the same kind for the binder and front box plate.

Before the leather is put on the binder, cut it to the exact length desired and bevel the ends. The leather can be the same width as the binder or a fraction of an inch wider. The wider facing is trimmed after it is bonded to the wood. Cut the leather so that the shuttle will enter the shuttle box with the grain of the leather and not across the grain. This arrangement gives better service and longer life.

Apply a thin coating of glue or cement to the leather facing and the wood surface, and let them set until they become tacky. Then place the leather on the binder and fasten one end with nails, tacks, or shoe pegs. All three fasteners are used, but shoe pegs are best. They're cheaper, and there's less danger that they'll come loose and damage the shuttle.

If pegs are used, an awl or punch is necessary to make holes in the leather and binder to drive the pegs into.

FINISHED BINDER is as good as a new one. The metal reinforcing strip (arrow) prevents splitting.

After one end of the leather is fastened, press the leather firmly onto the binder for its full length. Then fasten the loose end with pegs.

Keep Finished Binders Dry

After the binder is re-covered, place it in a warm, dry place for several hours to let the cement dry. The binder does not have to be put in a press because the shape of the binder holds the leather close to the wood and assures a good bond.

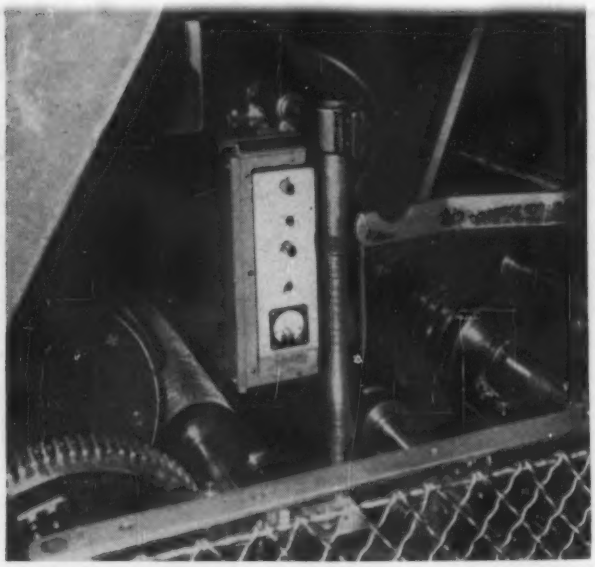
After the cement between the leather and wood is set, trim the edges of the leather with a sharp knife and smooth and polish them. A sanding belt and buffing wheel will speed the polishing job. Apply leather dressing or tallow to the leather, and work it in thoroughly. Rub the leather surface with a hammer handle or round stick to set raised fibers in the leather and to give the leather a better appearance.

If the binder is not placed in a loom immediately, store it in a dry place because moisture is harmful to the leather and the cement.

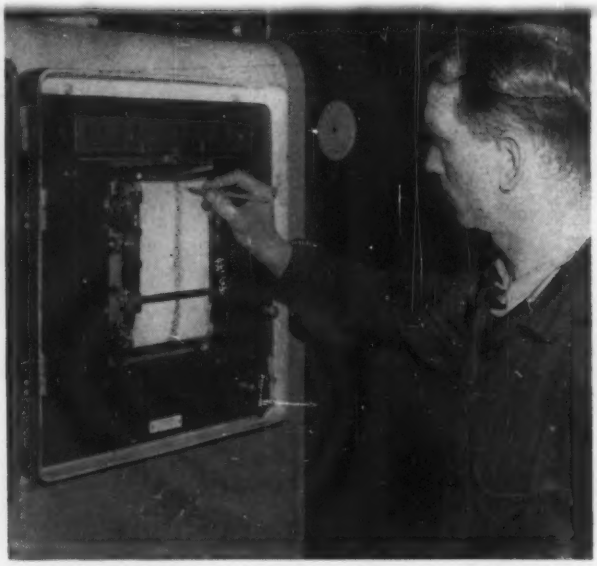
CONTINUED ON PAGE 206

by a man trained to do the work. He should be set up in

shim.



PHOTOELECTRIC CELL is positioned over the card web. Light from a fluorescent tube shines through the web. The light intensity changes when the web becomes thick or thin.



RECORDING CHART on the control section shows the variations in web thickness. Variable-speed controls adjust the doffer speed to keep the web within limits.

The Autocount Controls Wool CARD-WEB Weight

• A new method, formerly used for burglar alarms and automatic door openers, solves an old problem: keeping the weight of wool card web more constant. The result is better-quality yarn.

THE WEIGHT of the web delivered by a wool card is controlled by photoelectric-cell equipment installed at James Watkins & Sons Ltd., Holmfirth, Yorks, England. The cell measures the thickness of the web from the doffer; and when the thickness goes out of tolerance, the doffer speed is corrected to bring the card web back into tolerance.

The photoelectric cell is part of a measuring unit mounted directly on the card. The device measures the weight of the web by recording the intensity of a light beam passing through the web. The light is reflected back through the web by a mirror and is proportional to the change in weight of the web.

This variation in light intensity causes a variation in the output of the photoelectric cell. A servomotor is controlled from the photoelectric cell, and this motor controls the carding process through variable-speed controls to keep the web at a constant weight.

The source of light is a fluorescent tube located under the card web beneath the condenser taker-in rollers. The photoelectric cell faces down through the web at the light from a position in front of the smooth stripping roller.

Minor variations in voltage are overcome with a second photoelectric cell mounted under the web in front of the doffer. Light from the fluorescent tube is directed on it without passing through the web. This cell is tilted and connected so that the current generated is opposite to that generated in the other cell when the web is at the correct weight.

Chart Indicates Variation

The control section of the photoelectric-cell equipment is housed in a floor-mounted cubicle. A chart on the control section indicates variations in the weight of the wool web. These variations are repeated on a numerical scale above the chart so that they can be easily seen by the carder.

At the start of a production run, the carder switches on the automatic controller and obtains the correct weight of web by operating a control knob that adjusts the setting of the photoelectric cell. The card then remains self-adjusting at the desired level.

The pen trace on the control chart indicates zero when the web is of correct thickness. When the web is thicker than standard, less light is received by the photoelectric cell, less current is generated, and the pen on the recorder indicates a corresponding thickness of web. When the web is thinner, more light is received by the upper cell and results in a reversal of the effect on the pen recorder.

The automatic controller was designed by the Wool Industries Research Assn. and is known as the Autocount. Many experiments with electrical condensers and electrons emitted from radioactive sulfur were made before the photoelectric-cell principle was adopted.

From Target, British Information Service

Save Time With TRICOT Production Calculations

● **Five formulas are given to figure the amount of yarn required for each order, the time required to knit the order, and the pieces you can knit from your yarn stock**

By **FREDERICK SCHMIDT,** Regent Knitting Mills Ltd.

YOU CAN increase efficiency in your tricot mill by using these formulas to calculate production. You can plan proposed orders in advance, and the calculations will help reduce waste.

Suppose an order for 50 pieces of 30-den. nylon jersey with a yield of 3.1 yds. per lb. is received. There are to be 100 yds. per piece, and the finished width is to be 102 ins. You will require this information for your production calculations:

1. Gauge of machine
2. Working width of machine
3. Ends per warp
4. Top runner
5. Bottom runner
6. Quality per rack (480 courses) or stitches per inch
7. Yield of fabric in the gray
8. Number of racks per piece

These data are usually available from previous experience. If not, the data must be determined by sampling. From the above example, the specifications might be:

1. 28 gauge
2. 168-in. working width
3. 4,696 ends per warp
4. Top runner, 58 ins.
5. Bottom runner, 44 ins.
6. 7 ins. per rack quality or 68 stitches per inch
7. 2.1 yds. per lb. yield in the gray
8. 400 racks per piece

To Calculate Warp Yardage

$$\text{Top warp length} = \frac{Rt \times R \times P}{36} \text{ yds.}$$

$$\text{Bottom warp length} = \frac{Rb \times R \times P}{36} \text{ yds.}$$

Where: Rt = top runner
Rb = bottom runner
R = racks per piece
P = number of pieces

The example would work out to:

$$\text{Top warp} = \frac{58 \times 400 \times 50}{36}$$
$$= 32{,}222 \text{ yds.}$$
$$\text{Bottom warp} = \frac{44 \times 400 \times 50}{36}$$
$$= 24{,}444 \text{ yds.}$$

To Figure Yarn Weight

$$\text{Top warp weight} = \frac{E \times Yt \times D}{4{,}464{,}500} \text{ lbs.}$$

$$\text{Bottom warp weight} = \frac{E \times Yb \times D}{4{,}464{,}500} \text{ lbs.}$$

Where: E = ends per warp
Yt = length of top warp
Yb = length of bottom warp
D = yarn denier
4,464,500 = length in yards of 1 lb. of 1 den.

If top and bottom warps are the same yarn and the same number of ends, the top and bottom warp lengths can be added together so that:

$$\text{Total warp weight} = \frac{E \times (Yt + Yb) \times D}{4{,}464{,}500} \text{ lbs.}$$

The example would require:

$$\frac{4{,}696 \times (32{,}222 + 24{,}444) \times 30}{4{,}464{,}500} = 1{,}797 \text{ lbs.}$$

These calculations are figured on 100% efficiency and do not include the additional quantities of yarn required for setting up the creel and for waste. These figures vary with the equipment used in the mill.

To Figure Warping Production

$$\text{Production per hr.} = \frac{Ypm \times 60 \times E \times D}{4{,}464{,}500} \text{ lbs.}$$

Where: Ypm = warping speed
E = number of ends per section
D = yarn denier

Eight sectional beams were used in our example. Each beam holds 587 ends. So:

$$\text{Warping production} = \frac{500 \times 60 \times 587 \times 30}{4{,}464{,}500}$$
$$= 118 \text{ lbs. per hr.}$$

As the weight of yarn to be warped is 1,797 lbs., the warping time is:

$$\frac{1{,}797}{118} = 15.22 \text{ hrs.}$$

The warping time for the order would be 15 hrs. 14 mins. plus the downtime for stoppages.

To Figure Knitting Production

$$\text{Production per hr.} = \frac{\text{Rpm} \times 60}{S \times 36 \times Y} \text{ lbs.}$$

Where: Rpm = speed of camshaft
S = stitches per inch
Y = yield

Operating at 500 courses per minute:

$$\text{Production per hr.} = \frac{500 \times 60}{68 \times 36 \times 2.1}$$
$$= 5.8 \text{ lbs. per hr.}$$

As the weight of the order is 1,797 lbs., the knitting time is:

$$\frac{1{,}797}{5.8} = 309 \text{ hrs. } 50 \text{ mins.}$$

Stoppages are added to this figure according to timestudies taken by the mill.

To Convert Yarn Weight Into Fabric Length

A stock of yarn sometimes accumulates, and the length of fabric the yarn will knit is useful knowledge.

$$\text{Warp length} = \frac{W \times 4{,}464{,}500}{D \times E} \text{ yds.}$$

Where: W = weight of yarn in pounds
E = number of ends per warp
D = yarn denier

The warp length required for one piece is:

$$\frac{(Rt + Rb) \times R}{36} \text{ yds.}$$

CONTINUED ON PAGE 200

PERIODIC CLEANING is one of the main steps toward increased battery life. Use a brush and water to remove dirt and corrosion.

SPECIFIC-GRAVITY recording and checking of each cell once each month is necessary to keep up with battery conditions.

Observe These Rules For BETTER BATTERY OPERATION

• If you're baffled by battery breakdowns and short over-all life, observe these few simple rules of maintenance

By K. A. VAUGHAN, Gould-National Batteries, Inc.

SEVERAL THINGS CAN BE DONE to increase the life and efficiency of fork-lift-truck batteries. Regular maintenance under the supervision of an experienced battery man is the most important thing.

Use the Right-Size Battery

First, batteries should be used according to the capacity recommendations of the manufacturer of the equipment to be served. There is often a tendency to substitute a smaller-capacity battery because superficial surveys may indicate it will do the job. However, the battery must supply power for peak-demand operations at any time during the shift; and extra uses are invariably found for battery-powered equipment.

Substituting a smaller battery almost always results in overwork. Overwork overdischarges the battery and results in lower efficiency. Over a period of time, battery elements are invariably damaged; then the maximum available life is not realized.

A sufficient number of spare batteries is also important. As a guide, figure 2.1 batteries per truck as the minimum number for three-shift operation provided the available changing equipment can recharge each battery in 8 hrs.

Put One Man in Charge

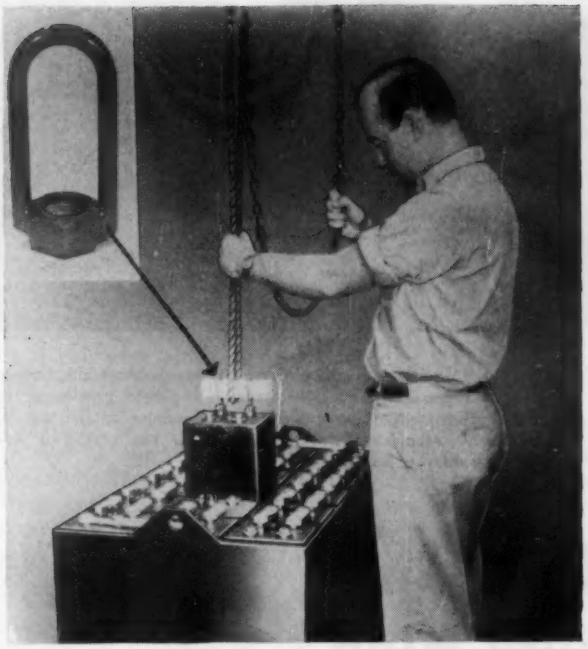
Put one man in complete charge of battery operations to centralize authority and responsibility. He should be well versed in battery technology and understand charging and maintenance procedures. The few safety rules applicable to storage batteries should be known and observed.

The simplest way to keep cycle-duty batteries at maximum efficiency is to establish a periodic maintenance and inspection schedule. The battery should be cleaned from once a day to once in several weeks, depending on the atmospheric and other conditions under which it operates.

Vent plugs should be in place and tight. Water must be added every one or two weeks when the battery is in full-cycle service to replace that lost by evaporation.

The specific gravity and voltage of each cell of the battery should be checked at least once every three months. It's better to check them once each month and directly after an equalizing charge.

Records of all charging and maintenance activities for cycle-duty batteries should be made and filed to form a case history of the battery. Identify each battery and truck by number. Such records show which



DAMAGED CELLS should be removed from the battery and repaired as soon as the damage is discovered. Eyebolts and nuts aid lifting.

SPREADER BAR on the hoist prevents bending the battery box when the battery is removed for charging and replaced.

batteries are being abused or are wearing out and make it possible to take steps to correct abuses or replace units in time to prevent production stoppages. From these records, troubles in operating equipment, charging equipment, and charging schedules often can be diagnosed.

Also, the men handling battery maintenance are more conscientious if they are required to record such data as date of charge; time, amperes; specific gravity at the beginning and end of charge; and addition of water.

Charge Batteries Right

A battery must not be overdischarged if maximum life is to be attained. Occasional overdischarge has no harmful effects; but, if continued, it will harm the plates of the battery and shorten its life. In addition, when a battery nears complete discharge, its operating efficiency decreases.

A cycle-duty battery should not be overcharged because this results in gassing and overheating. Gassing causes loss of water from the electrolyte. The practice of consistent overcharging will permanently damage some of the elements of the battery.

Boost charges occasionally are necessary when trucks are doing extra-heavy work or working extra hours. To prevent overdischarge of the battery, a brief charge is given during a lull in the work cycle (say during the lunch period) to prevent unnecessary downtime of the truck.

An equalizing charge should be given to cycle-duty batteries at least once a month but not more often than once a week. This is an additional charge of 3 or 4 hrs. at the finishing rate of the battery. The purpose is to make sure all cells are brought up to full charge.

Schedule Charging Operations

Considerable saving can be made in over-all plant operation if charging stations are located strategically. In large plants, it can be advantageous to situate small charging stations in outlying departments.

If central charging is used, the charging station should be situated so that all trucks have approximately equal distances to travel for charging.

Central charging has the advantage that it is more easily supervised. If conditions call for spot charging, proper supervision is extremely important.

In some plants, charged batteries are delivered to the equipment instead of having the equipment come to the charging room. The charged battery is placed in the fork-lift truck, and the discharge battery is returned to the charging room.

It is particularly advantageous to schedule charging operations where a large fleet of trucks is employed or where more than one shift is worked. By assigning each truck a certain time to report for charging, you will not pile up a backlog at the charging room, and truck downtime will be minimized.

Although charging equipment today is largely automatic, it must be correctly set for the size of the battery charged. If a voltage relay timer governs the charging period, it should be inspected frequently to be sure it is in good operating order.

If the ampere-hour method of controlling the charge is used, charging men must be thoroughly familiar with ampere-hour meter charts and must use them correctly. Otherwise, the battery will be either overcharged or undercharged.

Use Good Tools and Equipment

An occasional check-up of all charging equipment, ammeters, and voltmeters should be made. Although serious inaccuracies in this equipment will show up during charging, small inaccuracies often go unnoticed and over a period of time will lead to less-efficient charging.

Batteries that are stored for a period of time should be given a freshening charge once every three months to keep them in a fully charged condition. If this is not done, the battery eventually will discharge itself by internal action; and a lead-sulfate film will form on the plates. If allowed to remain, this film will harden and impair the efficiency of the battery when it is put in use.

Although seldom required, battery repairs are sometimes necessary because of cracked containers, internal shorts, or rough handling. When in-

CONTINUED ON PAGE 202

HOW SWIFT USES SPEEDAR, the new fineness tester.

Speedar sample (left) is placed between special sample fingers by the operator on the left, and its weight depresses the indicator (arrow). The operator on the right (middle photo) turns a wheel to bring the second indicator in line with the depressed indicator. This action adjusts the testing cylinder to the sample weight. The operator on the right (right photo) removes the sample from the fingers, inserts it in the cylinder, pulls the lever on the right, and notes the fineness reading on the center dial and the modulus reading on the vertical scale. Meanwhile, the other operator has placed a new sample between the fingers.

COTTON TESTING at Swift Keeps Costs Low, Quality High

A fiber-testing program assures the processing departments that the cotton purchased has suitable characteristics and so promotes more-uniform operations and makes maximum jobloads possible. The Speedar is used to determine fiber fineness. This instrument—

- **Cuts testing time almost one-third**
- **Increases accuracy by lessening fatigue**
- **Is completely portable**

By GEORGE H. BASS, Manager, Standards Dept., Swift Mfg. Co.

THE FIBER-TESTING PROGRAM at Swift Mfg. Co., Columbus, Ga., is an important factor in keeping costs low and quality high. By assuring our processing departments that the cotton purchased has suitable length, fineness, grade, character, strength, and dyeability, the program promotes more-uniform operations and makes maximum jobloads possible. Middling, Low Middling, and Strict Good Ordinary cottons, ⅞- to 1-in. staple, are used.

A good testing program also keeps our dyeing expenses at a minimum. Savings are substantial because we spend an average of 5¢ for chemicals and dyestuffs for each pound of finished goods, whether they are colored or not. Also, by properly blending our bales according to fineness, we have fibers with the same characteristics available day after day.

Generally, the shipper submits samples for our approval before the actual shipments of the bale. For example, we have a contract with a shipper for a certain number of bales at an established price. The contract specifies the grade, staple, fineness, color, and type and contains a guarantee that the cotton will have acceptable dyeability. Although testing of the samples doubles our work, it makes things easier for the shipper and minimizes the number of bales rejected after shipment.

When the samples arrive, our classers grade and staple them. Samples consist of sections from each side of the bale. Any samples they reject are tested no further. The samples then go to the laboratory, where our technicians process them through the Speedar to determine the fineness and modulus or stiffness. Here again, any samples not up to standards are tested no further.

At present, we are using the "go or no-go" system, where we accept all samples meeting our fineness standards. Finer samples go into one group and coarse fibers into another. When they arrive, the bales that the samples represented are grouped according to the tests and stored in the warehouse. About an equal portion from each fineness group goes into the floor mix, a 30- to 50-bale mix.

Differential Dye Test Used

The sample used for the Speedar test is next given a differential dye test to determine dyeability. The technicians number each sample as it is tested on the Speedar so that they know the bale from which it came.

After establishing the fineness and modulus and preparing the differential-dye-test sample, we usually select at random two samples out of 100 and test them on the Shirley Analyzer to double-check the grade.

Although we don't specify fiber strength on all our contracts, we check a minimum of six blended samples out of every 100. To supplement our previous determinations of maturity and fineness, we use the Arealometer to clear up a question when

CONTINUED ON PAGE 204

How One Mill Predetermines YARDS OF WOVEN CLOTH

THE most important job in the planning and production department of our group of mills is scheduling the exact pounds of yarn required at each process to weave each order of cloth. This work also includes calculating the yardage of cloth expected from each loom so that we can promise delivery each week.

In one of our mills, we have 16 types and widths of looms. We weave only six basic cloth styles, all within one range of picks per inch; however, we change styles frequently within this range of picks.

We formerly spent a lot of time in the planning department in (1) setting up figures on the yards of cloth expected from the looms and (2) converting the yards of cloth to the pounds of yarn required (based on actual loom efficiencies and forecast efficiencies).

We have greatly reduced the time for figuring the yards of woven cloth by making a formula and chart that give the yards of cloth expected from the looms at any given efficiency or speed and on any style of cloth.

Chart Saves Time

Now, we're able to give more time to important jobs such as long-range management planning in (1) setting up costs and (2) balancing yarn-processing machinery for possible changes in loom speeds from installing new looms, etc.

The formula for production in yards woven per 120 hrs. is:

1. 100% constant–ppm. x 7,200 (mins. in 120 hrs.) x 36 (ins. per yd.)

2. Coefficient – 100% constant – 1 + ppi. x expected operating efficiency.

To find the yards of cloth that will be woven from a loom in a 120-hr. work week, follow this example (shown in parentheses on the chart):

Style No. 464 has 64 ppi.; it's woven on 72-in. Draper L-model looms running at 113 ppm.; the average efficiency for this style of cloth is 90%.

1. Go down the Efficiency % column to 90.

2. Move to Picks-per-Inch column to 64.

3. Enter 0.014063 from Picks-per-Inch column into the keyboard of a calculator.

4. Go down the Picks-per-Minute column to 113 and use the adjacent number 22600.

5. Multiply the number in the keyboard by 22600, and mark off six decimal points.

Picks per Inch

Efficiency %	39	42	56	63	(64)	72	92	108
100	.025641	.023810	.017857	.015873	.015625	.013889	.010870	.009259
99	.025385	.025372	.017678	.015873	.015469	.013750	.010761	.009166
98	.025128	.023334	.017500	.015467	.015313	.013611	.010653	.009074
97	.024872	.023096	.017321	.015310	.015156	.013472	.010544	.008981
96	.024615	.022858	.017143	.015152	.015000	.013333	.010435	.008889
95	.024359	.022620	.016964	.014994	.014844	.013195	.010327	.008796
94	.024103	.022381	.016786	.014836	.014688	.013056	.010218	.008703
93	.023846	.022143	.016607	.014678	.014531	.012917	.010109	.008611
92	.023590	.021905	.016429	.014520	.014375	.012778	.010000	.008518
91	.023333	.021667	.016250	.014363	.014219	.012639	.009892	.008426
(90)	.023077	.021429	.016071	.014205	(.014063)	.012500	.009783	.008333
89	.022820	.021191	.015893	.014047	.013906	.012361	.009674	.008241
88	.022564	.020953	.015714	.013889	.013750	.012222	.009566	.008148
87	.022308	.020715	.015536	.013731	.013594	.012083	.009457	.008055
86	.022051	.020477	.015357	.013573	.013438	.011945	.009348	.007963
85	.021795	.020239	.015178	.013492	.013281	.011806	.009240	.007870

Picks per Minute

Ppm.	100% Constant	Ppm.'	100% Constant	Ppm.	100% Constant	Ppm.	100% Constant	Ppm.	100% Constant	Ppm.	100% Constant
88	17600	128	25600	141	28200	154	30800	166	33200	178	35600
92	18400	129	25800	142	28400	155	31000	167	33400	179	35800
99	19800	130	26000	143	28600	156	31200	168	33600	180	36000
106	21200	131	26200	144	28800	157	31400	169	33800	181	36200
(113)	(22600)	132	26400	145	29000	158	31600	170	34000	182	36400
120	24000	133	26600	146	29200	159	31800	171	34200	183	36600
121	24200	134	26800	147	29400	160	32000	172	34400	184	36800
122	24400	135	27000	148	29600	161	32200	173	34600	185	37000
123	24600	136	27200	149	29800	162	32400	174	34800	186	37200
124	24800	137	27400	150	30000	163	32600	175	35000	187	37400
125	25000	138	27600	151	30200	164	32800	176	35200	188	37600
126	25200	139	27800	152	30400	165	33000	177	35400	189	37800

How Four Factors Affect Ashcroft INTERFERENCE TABLES

The Ashcroft system of allowing for interference [TW, Dec., '52, p. 100, and Dec., '53, p. 134] has four complications that should be understood:

Distribution: operator time is usually uneven, and the Ashcroft numbers should be adjusted

Rating: a standard-pace system is favored to the incentive-pace system, but the numbers can be used with any system

Allowances: rest times, usually between random and selected, should be averaged

Internal work: priority of internal work in relation to clearing stops should be determined

By THOMAS F. O'CONNOR

THE ASHCROFT TABLES present no difficulty because they have a limited and sharply defined function: for this value of p and that value of N, what is the value of A? In that function they never fail.

But in the gathering and sorting of the information that goes to make up p, and in the handling of A to make standard times, difficulties are sometimes encountered.

Distribution

Operator time t is a compilation of several smaller times of various lengths and random occurrence in the cycle. Distribution is how those lengths look when examined in isolation. If they are all approximately the same length, the distribution is equal.

Another possibility is a progression. If they can be arranged in a sequence, with each greater by a fixed amount than its neighbor, the relationship would be a straight-line or arithmetical distribution. Perhaps the distribution can be arranged to form a geometrical progression; or, in the extreme case, an exponential curve might be formed.

Fortunately, industrial engineers do not have to worry. Ashcroft has taken care of the problem. His formula for A is perfectly general and good no matter what the distribution. The formula, however, requires the distribution pattern before it can give a value to A. For a given p and N, interference is least and A is greatest when the stoppage times are equal. Interference is greatest and A is lowest with an exponential pattern of distribution.

But there is an easy way out. Since the difference between the extreme values of A is not great, it would be absurd to calculate sets of figures to cover every eventuality. The tables are based on equal distribution; that is, on minimum interference. Even if you know the distribution is not equal, you would not be far wrong in using the table value of A unaltered. However, you can play safe by cutting down A, depending on where, in the range between equal and exponential, the distribution might actually be.

The accompanying graph will help in this adjustment. An example will show how. Suppose you have: $N = 6$, $T = 30$, and $t = 4.5$ hrs., with t made up of six doffs of 30 mins. each and one combined creel stop and doff of 90 mins.

Calculate p as usual:

$$p = 4.5 \div 30 = 0.15$$

Then A (from the tables) $= 4.80$.

The distribution is not equal, but it also is not exponential. Ideally, A should be calculated precisely on the information available; but that task is not easy. So you use the chart. Calculate the load factor:

$$B = p \times A = 0.72$$

How To Use Graph

Now go to the graph. Start on the bottom line at 0.72 and go up until you cut the curve of where $p = 0.15$ would be shown. Then, horizontally on the left-hand scale, read the percentage difference. It is about 4½%. So if you had a true exponential distribution, you would knock 4½% off A. However, since the distribution is not truly one or the other but is somewhere in between, you can compromise by taking off half, which is 2¼%. This reduction cuts A from 4.80 to 4.69; we know we are not 2¼% out, and we may be right on the button. The load factor, on the bottom line, should preferably be based on the exponential A, which you don't know; but the difference is slight.

Another interesting point arises out of this example. During the 90-min. combined creel stop and doff, the operator may be lucky and have no other stoppages, in which case there is no problem. However, if he is unlucky and another machine stops for doffing before he finishes the first, there is an intriguing situation.

Should he leave the first and attend to the second, or should he let the second wait? The answer depends on how much more work he anticipates on the first doff. If more than 30 mins. is involved, it would pay him to go to No. 2 and get that started. If it is 30 mins. or less, then he should finish with No. 1 first. It is possible for a smart operator to get extra production by using discretion in such situations.

Rating

The method of rating most commonly used is based on two distinct tempos of work, called 60 and 80. As the system is generally presented, the 60 pace corresponds to the average competent man who is paid by the hour without incentive pay. When he is offered a wage incentive,

he supposedly ups his pace by 33⅓% —to the scale number 80. Consequently, an observed time, if the pace is rated less than 80, is not used raw. It is adjusted to the time that would be taken by a man working under incentive conditions.

In contrast, the standard-pace system is an unhurried rate of work. The man is purposeful and competent but unhurried. He knows what he is doing and what he has to do next. He does not hesitate or fumble; neither does he hurry. His work is well done, and when he finishes a job it does not have to be redone. If he were under the compulsion to make haste he would not be so successful. His effective pace would probably be less than before.

Essential Difference

The fact that the scale number 100 is used is not the essential difference between it and the 60/80 system. The essential difference is that no expectations of productivity are based on a faster pace of work.

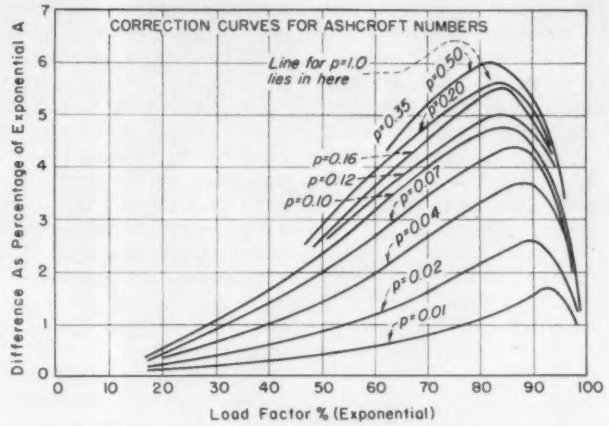
Generally linked with the 60/80 system, when applied to machine or process work under incentive, is a device that goes under several names —"process allowance" is probably the best known. This device, in effect, says that a man cannot earn bonus on any time not spent in physical activity. If attending to his machines takes 80% of his time, he is permitted to earn bonus on only 80%.

Often the clerical work needed to implement this method is more costly than the money saved, but that is not the only objection. Bonus is paid out of profitable productivity; and it is the manager's, not the worker's, prerogative and responsibility to see that allocations insure the best results, even if the worker is idle for 50 mins. every hour. Therefore, in the standard-pace system, no deduction is made for fictitious idle time. Calculations are simplified, and, more important, it is a fair system.

There are variations of pace during a timestudy on such a man, and there are variations between individuals. So an average is taken or a rating applied. In either case, the standard performance is 100; and forecasts of production are not based on an expectation of speeding up.

In brief, the system is to calculate machine allocations on economic grounds, with management reserving the right to act on the findings freely. Then standard time, based on the standard 100-pace operator, comes into effect. If there is to be an incentive scheme, which is advocated, a standard performance earns standard bonus. At first sight, it may appear that bonus is paid for nothing; but not so. Extra production is derived from an increased consistency of application to the job.

With t at 100, excluding allowances, how does this time compare with a 60/80 man? This question is in the category to which, for good reasons, statesmen refuse to give a direct answer. But to be helpful, an opinion based on experience is offered: where a standard pace comes up with a time of 10 mins. for instance, an incentive pace might give



HOW TO USE GRAPH: With unequal distribution of operator time t, Ashcroft numbers have to be adjusted. For example, suppose t is made up of six doffs of 30 mins. each and one combined creel stop and doff of 90 mins. To make an adjustment, calculate the load factor: $B=p \times A= 0.15 \times 4.80=0.72$. The table will give the percentage difference between this load factor and the load factor based on an exponential distribution. With the curve for $p=0.15$ estimated, this percentage is 4½%. Since the uneven distribution is between equal and exponential, take half of 4½% and adjust the Ashcroft number: $0.0225 \times 4.80=4.69$.

Review of Basic Principles

Interference concerns the semiautomatic machine, such as a loom, where one operator has more than one machine to look after and stops occur at random. Interference is the time lost in a cycle of production because of overlapping machine stoppages. Since only one machine at a time can have the operator's attention, others that stop while he is busy have to wait. Interference is the average waiting time per machine in the cycle of production of one unit. It can be expressed in absolute time or as a percentage of the operator time or of the total cycle time.

Regardless of stoppages, production is in proportion to the number of machine running hours per clock hour, a number represented by A. By ignoring interference and concentrating on A, you get a more useful quantity. A depends on the number of machines and the ratio of operator attention time t to machine running time T. This ratio is called the cycle ratio and represented by p. Tables of A values, corresponding to various values of p and N, have been calculated. In the A values, there is a built-in allowance for interference.

Here is a simple example of the use of the tables: Five looms; 2 hrs. operator time per unit; 10 hrs. loom time.

First calculate p:

$p = t/T = 0.20$.

Now find the value of A on the tables at the intersection of the horizontal line for $p = 0.20$ and the vertical column for $N = 5$. A is 3.75. This value means that you can expect an average of 3.75 hrs. of total machine production per hour from the five machines in the care of one operator. The net cycle time H on each loom is found by:

$$H = \frac{N \times T}{A} = 1.333 \text{ hrs.}$$

In this time, you can expect one unit from each loom, five units in all.

If there were no interference, H would be:

$$T + t = 1.200 \text{ hrs.}$$

Interference is responsible for the delay of 0.1333 hrs. (1.333 — 1.200). This delay amounts to about 66.67% of t— information that is mildly interesting but has no particular value.

The operator's load factor is the fraction of each hour on average that is taken up by attention to the machines. Ignoring internal work, which is discussed in the article, the load factor $B = p \times A = 0.75$.

about 9 mins. If that were true, 100 on the standard-pace scale would correspond to about 72 on the 60/80 scale.

Which is correct? The answer to that question is anybody's guess. Human skill varies a great deal. Is the difference of great significance? This question has many answers, depending on p and N. Two examples:

1. $T = 45$ mins. and $N = 5$.
   If t is 10, $p = 0.222$ and $A = 3.59$.
   If t is 9, $p = 0.200$ and $A = 3.75$.

The difference is a little over 4.4%, which is the additional productivity the 60/80 system might ask of its incentive-paced operator.

2. $T = 360$ mins. and $N = 30$.
   If t is 10, $p = 0.0278$ and $A = 28.13$.
   If t is 9, $p = 0.0250$ and $A = 28.55$.

The difference is a little under 1.5%.

In either example, but particularly the latter, there is not cause for a fight.

Allowances

In measuring durations and frequencies and combining them to produce t, interference and other losses not within the control of the operator are not included. Relaxation and fatigue allowances do not enter, but a small amount (about 3%) has been added for contingencies.

There are well-known systems that attach allowances to t and even to each element of t; and with manual work without machines, attaching allowances is reasonable. But when such a system is applied to the man-machine complex, it is usually a device for making sure that no allowance is awarded for the time the operator is unavoidably free from physical activity.

There seems to be no merit in applying such a system to multimachine work: first, because the manager and not the operator fixes the load and the accompanying idle time; second, because an operator cannot relax while his machines are running—he is on the job, watching and planning ahead; and third, because quality considerations demand the operator to be present whenever the machines are running.

In all the cases dealt with, an allowance for relaxation is put into the cycle time on the assumption that the operator must stop all machines when he wishes to leave them.

For instance, if allowances are assessed at 10%, the reasoning is: 10% of the hour for rest leaves 90% for work. If the net cycle time is, say, 9 hrs., it follows that the standard time is 10 hrs.—and in similar ratio in other cases.

With an incentive scheme, the standard bonus (for instance 33⅓%) is awarded to the operator who averages one unit per machine per 10 hrs. Total pay is in proportion to total production, as in a piecework plan.

By covering for one another, some operators will probably gain part of the 10% for bonus. If so, the operator gains bonus and the manager gains production. Who is the loser? This commonsense solution seems fair as well as simple.

However, if you distrust simple solutions, here is a general explanation that includes the method as a special case.

In discussions on relaxation, it is useful to denote the total time per hour lost to production by a. Then production is going on 1—a, which is called K. K is the work factor. There are two main divisions:

1. *Selected Relaxation*

In one case, the operator leaves his machines only after stopping them all. And: $A^1 = K \times A$, where A represents the full or theoretical production and A^1 the production achieved or budgeted as standard.

In another case, the operator leaves his machines only when all are running; and here, there are two extremes to consider. If the absences are relativly long but rare, production tends to be about the same as in the first case: $A^1 = K \times A$. If the absences are frequent but brief, the operator may avoid stoppages and achieve $A^1 = A$.

In reality, it is unlikely that either of the extremes would be found. A solution would have to take into account the duration and frequency of absences. Usually a satisfactory allowance can be calculated.

However, as in all timestudy matters, a tolerance must be attached to the result.

2. *Random Relaxation.*

If the operator takes his leave at random, without considering whether his machines are running or stopped, the condition is called random relaxation. Again, there are two possibilities. If he absents himself often for relatively short periods, A^1 tends towards the value obtained if the tables were listed with an adjusted cycle ratio, p^1, instead of p:

$$p^1 = \frac{p}{K}$$

If the operator is absent for relatively long periods at a time but at rare intervals, A^1 is reduced, with the bottom limit: $K \times A$. Again, what actually happens is in between these two extremes.

Some estimating and averaging must be done.

Internal Work

So far, only work done on stopped machines has been considered. An operator can have work to do while his machines are running. This work, which is quite common, is called internal or in-cycle work. Once more, there is no problem in using the tables. But the facts should be gotten straight before the tables are used.

Counting zero internal work, just dealt with, there are four cases. The other three: internal work that never challenges the priority of external work, internal work that competes equally for the operator's attention, and a mixture of the second and third.

For illustration: $T = 10.2$, $t = 1.3$, $t_1 = 0.2$, $t_2 = 0.2$, and $N = 8$.

The symbol for internal work is t_2.

Case 1: Internal work zero

$p = t \div T = 1.3 \div 10.2 = 0.1275$
From the tables: $A = 6.36$.
Then: $H = N \times T/A = 12.85$.
Load factor $B_e = p \times A = 0.81$.

Case 2: Internal work with no priority.

This work is instantly abandoned when a machine stops. Full priority is given to clearing the stoppage and any other stoppage that develops or is imminent. All machines are running before the operator returns to internal work.

In this case, t_2 has no effect on the cycle time or on the load factor B_e. However, an internal load B_i is superimposed, and B_i must be added to B_e to give the total load factor B.

$$\text{So: } B_i = N \times \frac{t_2}{H} = 8 \times \frac{0.2}{12.85} = 0.1245.$$

$$B = 0.8100 + 0.1245 = 0.9345.$$

Since B is less than 1, both loads can be accommodated. If t_2 were about 0.305, the operator would be 100% loaded with work.

Case 3: Internal work equal in status to the external

In this case, regardless of the condition of the machines, a task that falls due must be tended as if it were a machine stoppage. This time is called t_1. This situation calls for a different treatment.

Ignore the original calculation of cycle ratio and the steps following (net cycle time, load factor, etc.). To find the cycle ratio, use the formula:

$$p = \frac{t + t_1}{T - t_1} = \frac{1.3 + 0.2}{10.2 - 0.2} = 0.15$$

To find A, use $p = 0.15$ and $N = 8$. A is found to be 5.90. Cycle time $H = \frac{N\,(T - t_1)}{A} = 13.55$.

The external load factor $B_e = p \times A = 0.15 \times 5.90 = 0.885$. ($B_i = 0$)

Case 4: Two kinds of internal work

This case is more usual. There is

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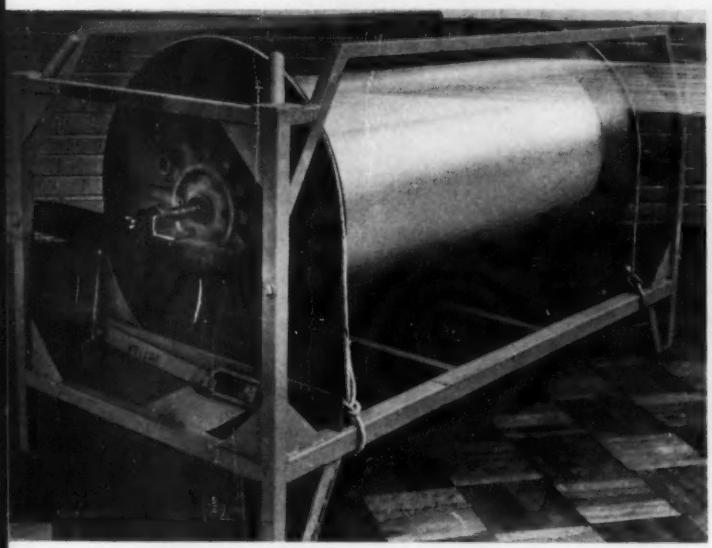
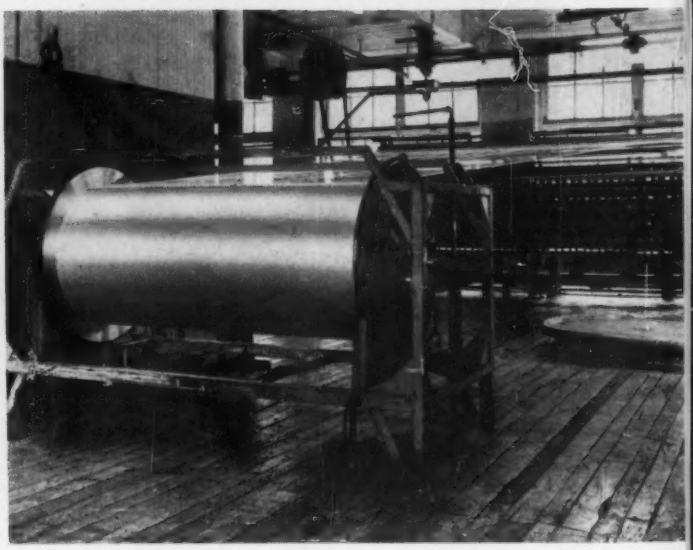


ANGLE-IRON BRACKETS, carrying ball bearings, are bolted to the shipping rack to receive the beam shaft.



RAYON YARN is drawn off the beam and wound directly on braider bobbins. Brake ropes and weights provide tension.

Now— Shipping Racks Used As BEAM STANDS

• Using shipping racks for section-beam stands is a new materials-handling technique that is saving labor, time, and space.

By WILLIAM P. CRAWLEY,

Textile Research Dept., American Viscose Corp.

SECTION BEAMS transported between yarn producers and textile mills are shipped in substantial metal racks. The single-beam rack is easily and quickly converted into a beam stand with simple and inexpensive materials.

One mill using this new type of rack is a braiding mill where yarns are wound from the beam onto braider bobbins on a 378-end Whitin quiller. When a beam is empty, the ends on the new supply beam are hand-twisted onto the ends from the empty beam still threaded in the winder.

Plush-fabric weavers who wind their filling yarns on gang winders in the same manner as the braiding mill find this technique useful. This winder is well suited to handling yarn from beams because the spindles are friction-driven to take care of any possible slackness in individual ends.

Two Supports Are Needed

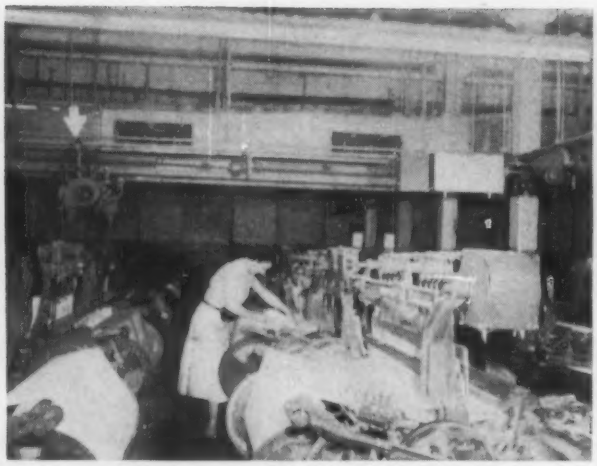
The adaptors required to convert these racks to beam stands are made from two angle-iron supports. One support is bolted on each end of the rack, and each bracket carries a ball bearing and bearing bracket that is easily fitted to the beam shaft.

A jack or substantial lever is required to lift each end of the beam as the adaptors are bolted to the rack in the mill. When a section beam is empty, the adaptors are transferred in a short time to another rack containing a full beam, and the empty beam is returned to the yarn producer.

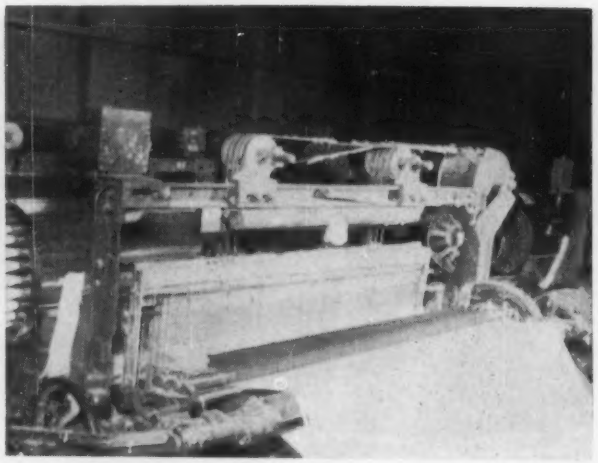
When this method is used, the section beam is removed from the shipping rack only in the yarn producer's plant.

Suitable brake ropes and weights are applied to provide tension as the yarn is unwound.

This materials-handling method not only saves time, labor, and space but also adds to safety and eliminates overhead lifting devices.



LOOM CLEANER (arrow) has a separate I-beam but operates off the same monorail used to support the beam-handling hoist.



LOOM ARCH and harness straps are kept clean with the back arm of the blower on the cleaner. No other cleaning is required.

MECHANICAL LOOM CLEANING
Improves Fine-Yarn Cloth

The mechanical loom cleaners installed to help weaving conditions on fine-yarn chambray at Woodside Mills' Liberty Plant are—

- **Reducing manual cleaning**
- **Keeping the weave room cleaner**
- **Improving cloth quality**
- **Slowly paying their own way**

By RICHARD B. PRESSLEY, Associate Editor, TEXTILE WORLD

A MONORAIL system with double-barrel action has been in operation in the weave room at the Liberty, S. C., plant of Woodside Mills for about 1½ years. The first part of the monorail is for beam handling. That part of the system has made it possible for the mill to place 40 more looms in the existing building to raise over-all weave-room production 17%.

The second part of the monorail system is a mechanical loom cleaner. Two advantages obtained are: (1) a reduction of 1½ men employed in weave-room cleaning and (2) a much cleaner weave room.

The total investment in the combined systems was around $20,000. The beam-handling system cost a little over half of this amount. The 17% increase in production made possible by adding 40 more looms paid for the beam-handling installation fairly fast.

The loom-cleaning-system costs will have to be dug out more slowly. But if you count the profits from lint-free and cleaner cloth, the investment will be amortized faster.

The Superintendent Says:

Superintendent Paul E. Bowie, Jr.'s, comments on the loom cleaner are: "We haven't yet realized the full potential returns from the loom cleaner because it works best below 75% r.h. At that relative humidity, the lint is blown off the looms and warps more thoroughly.

"These fine combed-cotton yarns of 40s to 60s warp are sometimes difficult to weave into shirtings and dress goods. For that reason, we run our relative humidity up to 80% at times. But we're constantly making loom-setting improvements to pull the relative humidity down. Right now, we're running 76%.

"But our weave room is always in the same state of cleanliness, which would not be true with manual cleaning.

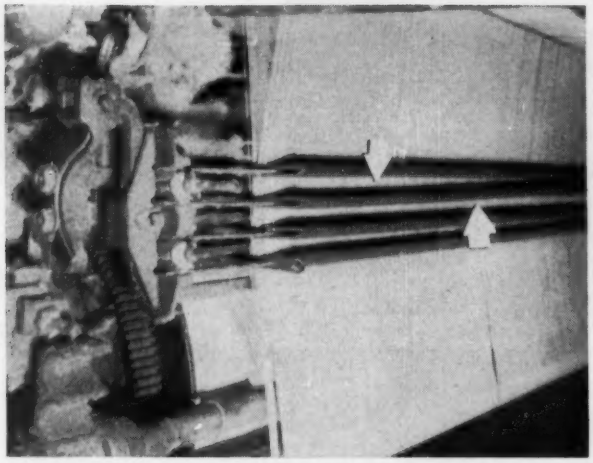
"Another asset of the loom cleaner is that we feel free to urge every production employee to take great pains in keeping the yarn and cloth clean. The employees can now see the importance of clean cloth because we've invested in the cleaning equipment for only two purposes: better-running work and cleaner cloth.

"We'd hate to do without the loom cleaner."

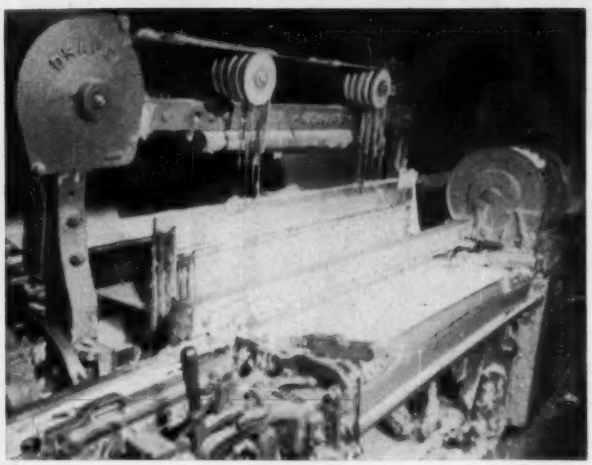
What the Employees Say

Mr. Bowie's comments were expressed in about the same way by production employees all the way down the line.

R. C. Wood, overseer of weaving, is proud of the cleanliness of the weave room even though he has two other weave rooms with more-modern looms.



DROP WIRES are kept completely clean (arrows) by the blower alone. What's commonly a lint-catching trouble spot is no longer a problem.



HARNESSES and handrails are cleaned by the front blower but are also given manual cleaning each day. Lower humidity will help.

Second Hand Arthur Mullinnix has direct charge of the looms equipped with the cleaner. His most-pointed comment is, "I didn't realize how valuable the cleaner was in weaving until it was out of operation once for two days when it was first installed."

The loomfixers' jobs are affected only indirectly by the cleaner. But naturally, cleaner yarns and better-running looms mean less work for loomfixers.

One loomfixer said, "I was on this section of looms when we changed from print cloths to the present fine warp-yarn stripes and solid colors. The cleaner was installed at the same time. So I don't know what trouble we would have had without the cleaner. With the cleaner, there's less oily lint stuck to the looms, which keeps my hands clean and helps me keep the cloth cleaner."

Weavers' Gain Is Great

Except for management gains, the weavers gain more than anyone else from the loom cleaner. One weaver said, "I ran these looms before the cleaner was put in and the cloth styles were changed. My looms and cloth are much cleaner now, but I do have bad places made in the cloth from lint blown into the open shed between the harnesses and reed.

"However, I had the same bad places when the looms were blown off with an air hose. The difference is that with blowing off, the blown lint came at one time; now, the bad places are made any time."

Each employee discussing the cleaner repeated Mr. Bowie's comment, "I wouldn't want to do without the cleaner."

The warp-handling and loom-cleaning system is made by American MonoRail Co. There are three separate lengthwise lines of equipment in the weave room, and each line serves two alleys of looms.

The cleaner has a two-head blower, and each blower has an oscillating arm. One arm blows off the front half of the loom, and the other arm blows off the back. The cleaner cleans only one row of looms at a time. When the cleaner reaches the end of a row of looms, the head moves to the next row of looms; and a limit switch reverses the movement of the monorail I-beam. There are 23 looms in each row. One cleaner serves 92 looms and makes a cleaning cycle every 9 mins.

When a warp is to be cut out of a loom and a new warp put in, the cleaner is stopped in a position out of the way and remains stopped until the warp or warp beam is laid in the loom. All warps are drawn warps since portable tying is not used. Warps are drawn on a Barber-Colman drawing-in machine.

The cleaner does a good job of cleaning: (1) the clock-spring-top harness-spring housing, (2) harness sheaves and straps, (3) loom arch, (4) drop wires, and (5) the warp back of the harnesses.

There's Manual Cleaning, Too

Additional manual cleaning is done each day to: (1) the harnesses, (2) handrails, and (3) filling fork grates. These parts are cleaned on one-third of the looms each shift. With this schedule, the parts are cleaned manually on all looms every 24 hrs. The parts are cleaned as a part-time job by a man who cleans looms at warp-outs.

Looms are sprayed at warp-outs with a chemical cleaner; and then they're blown off with an air hose. Blowing the lint from the top section of the looms to the bottom section and to the floor by the mechanical cleaner does not make the looms harder to clean at warp-outs.

The beam-handling and loom-cleaning equipment requires little maintenance since the initial setting-up period. The mill-maintenance department handles all maintenance. The bulk of maintenance consists of inspecting and lubricating the equipment regularly.

There is a total of 271 looms in the weave room where the cleaner is located. There are 164 E-model looms and 107 K-model looms. Both models of looms are 40 ins. wide and run at 175 ppm.

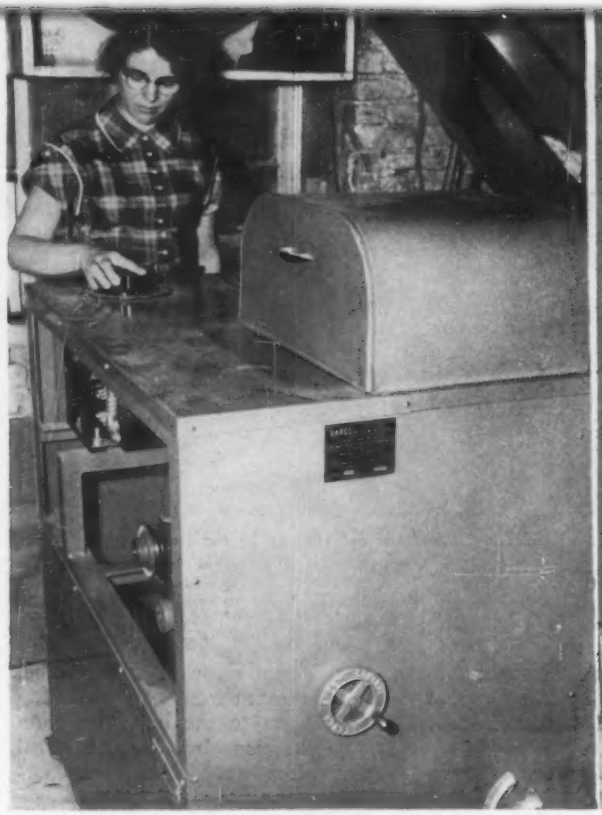
There are also two other weave rooms at the Liberty Plant. The other two weave rooms are equipped with X-2 looms and a few E-models.

Both the K-model and E-model looms in the weave room where the monorail is located are equipped with clock-spring top harness motions. The motions have space for six harnesses, but only four harnesses are used on most styles of cloth woven at present. All looms are driven by individual motors.

The weave room is equipped with an evaporated-water air-changing system. Auxiliary atomizer heads at duct openings supply additional humidity. The temperature is held at 80° F. with the present 76% r.h.

Most cloth being woven at present is chambray made from 40s to 60s warp and filling. Most warps are made in stripes, but a few are in solid colors. Many styles and colors are woven. All warps are made from combed yarns. The filling is combed yarn also.

Tips on STOCK DYEING



RHEOSTATS on top of the machine are adjusted by the operator to give the correct boarding or preboarding conditions. The handwheel at the front of the machine determines the speed of production. The machine is switched over in a few minutes.

FOR PREBOARDING, a hamper is pushed under the rotating forms. The preboarded goods fall in the hamper. For final boarding, a tray is clamped to the side of the machine, and the boarded goods are laid on the tray in lots of 1 doz.

On Same Machine— BOARD 240 Doz. PREBOARD 300 Doz. Daily

• A North Carolina mill has increased production and saved on steam costs with an automatic boarding and preboarding machine that is used for stretch-nylon, cotton, and stretch-cotton socks

By JAMES H. BLORE, Associate Editor, TEXTILE WORLD

PREBOARDING PRODUCTION of men's stretch socks at Southerland Dyeing and Finishing Mills, Inc., Mebane, N. C., has been increased to 300 doz. per operator per 8-hr. shift with a Sarco boarding machine. The machine is changed for final boarding in a few minutes. Production of finished socks is about 240 doz. per shift.

Two machines take up little space near the windows where large fans draw out the heat from the room and make working conditions comfortable.

One machine is generally set up for preboarding and one machine for final boarding. When production conditions warrant a change to two final boarding machines or two preboarders, the operators make the necessary adjustments to change the machines.

How Operator Changes Machine

The eight forms on the rotating hub are changed by the operator according to the style and size of the sock to be processed. Socks from 6½ to 13 are processed, and knee-high hosiery is also boarded. The eight forms are changed in less than 3 mins.

The operator also adjusts the heat of the infrared elements that set the stitches in the fabric. About 350° F. is used for preboarding stretch socks. This temperature depends on the yarn and construction of the sock.

Two or three tests are run to determine the exact temperature. The temperature does not have to be so precise as for conventional boarding methods because the heat is dry.

The rotating forms pass between two groups of the heating elements. Each group is controlled separately from two rheostats on the top of the

CONTINUED ON PAGE 202

Tips on STOCK DYEING

• Stock dyeing lends itself well to dyeing all the synthetic fibers as well as the natural fibers. Pressure dyeing at high temperatures in suitable machines gives excellent results at low cost compared to yarn dyeing.

STOCK DYEING offers several advantages over other methods of dyeing synthetic fibers. With the newer stock-dyeing machines, high temperatures can be employed that give increased color yield, reduced dyeing time, and improved fastness characteristics.

Dyeing the fibers in stock form does not guarantee uniformity; in fact, there may be considerable unevenness within any one lot. Stock dyeing at its best depends on dye lots that are large enough to require several loads of one shade. Then the dyer has an opportunity to make corrections after the first lot is dyed so that the blend resulting from the several dyeings will match the shade.

Core-Bored Samples Are Best

Sampling of stock-dyed fibers may be done by several means, but the most accurate method is to cut cores out of the dyed lot. The fiber is first baled and the cores cut in the direction of compression. The cores are mixed and run through a sample card. Metallic-wire cards are favored because the stock need not be oiled, a factor that can influence shade. The resulting sliver can then be spun into yarn to match yarn samples or left flat, in which case the carded stock can be made into a pad on a small fulling machine. For pile-fabric matching, a pom-pom can be made so that fiber-end color can be evaluated.

The opportunity for blending various lots gives the dyer considerable help in establishing uniform shades.

Generally, the cost per pound for dyeing fiber is much less than for yarns or fabrics. For example, to dye Orlon 42 black will cost about 95¢ per lb. for yarn; but the staple can be stock-dyed for about 45¢ per lb. Light shades may go as low as 15¢ per lb. on staple fiber.

Another factor is that colors can be used that have superior fastness but are not particularly level-dyeing.

Excessive stripping and redyeing are rarely needed in stock dyeing because of the chance to blend lots. This elimination cuts costs, and the fiber quality is not impaired by excessive processing.

Synthetics such as Orlon 42 and saran may shrink if they are dyed in yarns or fabrics. They may be mock-dyed in stock form to produce evenly shrunk and relaxed fiber more suited to the production of staple fabrics. In the mock-dyeing treatment, no color is used; but detergents, antistatic agents, or finishes may be incorporated to improve the working qualities of the yarn and also of the finished fabric.

Yarns made of blended fibers exhibit great uniformity and superior fastness if separately dyed in stock form and blended in the carding operation.

With the possible exception of fine wools intended to be spun on the worsted system, apparently all fibers can be satisfactorily stock-dyed. One advantage of stock-dyeing the hydrophobic fibers is that thorough centrifuging after dyeing leaves them dry enough to go directly to the pickers and cards with a moisture content of about 10%.

Other processes such as bleaching or light scouring can be done easily in stock-dyeing equipment, as can the application of antistatic agents, softeners, or other special chemicals.

Continuous Methods Can Be Used

Modified scouring equipment has been successfully used in continuous dyeing of fine wools. Light and medium shades are produced with metallized or neutral-dyeing colors. There is less matting and chemical damage by the continuous method, since processing time is shorter; and while color values are somewhat less, savings in steam and rehandling and improvement in fiber qualities make the method attractive for fine wools.

In properly designed stock-dyeing machines, temperatures up to 240° F. are possible, with resultant improvements in dyeing made on the synthetic fibers. Not only are increased lightfastness and washfastness obtainable, but deeper shades can be produced. Many side effects that are beneficial result from higher temperatures, such as better dye dispersion, more open fibers, better crimp and penetration, and generally no need for carriers. Better fastness to crocking may be expected, and fiber shrinkage is completed so that this factor does not cause trouble in the piece goods.

Pressure Brings Problems

Levelness is the major problem in pressure dyeing because the fibers tend to pack down and form channels under pressure. Wetloading and reduced liquor flow help to minimize the trouble; but in cases where severe channeling occurs, the unlevel results are difficult or impossible to correct. Navies, browns, and blacks give the most trouble in this respect when dyed by the cuprous-ion method.

Another problem is the inability to sample the load for shade during the dyeing with any degree of accuracy. Sample kiers are not always dependable because pressure ratios and liquor flow in the sample kier are seldom the same as in the lot.

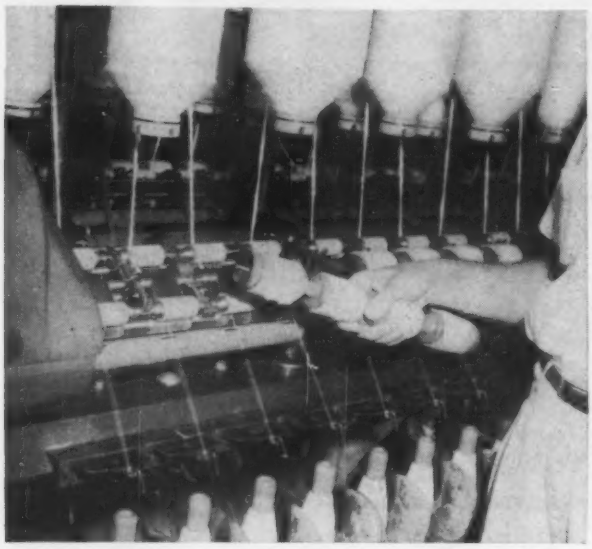
Formulas for dyeing have to be developed under pressure, which requires small laboratory pressure vessels.

In spite of the peculiarities of the high-temperature system, the advantages outweigh the disadvantages in a number of particulars that include better color value from the dyes, less steam cost, and the production of superior fiber because of reduced processing time. High-temperature (225° F.) dyeing of wool stock produces excellent results with superior physical characteristics to those of wool dyed for longer periods at 212° F. Blends of wool and Orlon or Dacron dyed at 225° F. give satisfactory shades, although it is more customary to dye the fibers singly to get the best all-round results.

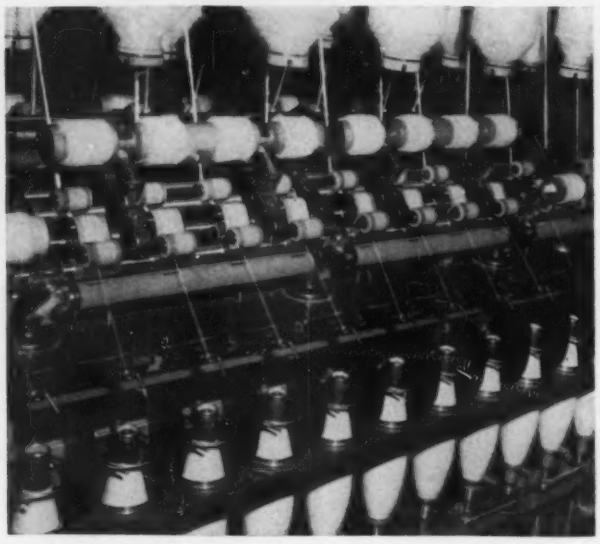
Dynel staple gives good results at 215 to 220° F. Saran can be handled successfully at 212 to 215° F. in a closed system.

Stock dyeing of synthetics at temperatures suited to their characteristics will undoubtedly continue to be a major factor in the industry where piece or yarn dyeing is impractical.

From a paper presented at the Philadelphia Section of AATCC by Jackson Bauer, Fred Whitaker Co.



MODERNIZATION of the drafting system was delayed because of a parts shortage. Temporary modifications were made by the mill shop; narrow aprons were put in, and most of the cleaners were removed. These changes made cleaning easier and improved drafting.



THE NEW DRAFTING system has ball-bearing rolls, narrow aprons and cots that permit easier cleaning, and a mill-made lubrication system for the front top roll. On this frame, experimental balloon-control rings permit increased front-roll speeds.

Beaumont SPINNING Improvements Increase Production

Installation of a new drafting system, lint-free creels, mechanical cleaners, and large packages have resulted in—

- **12% increase in production**
- **20% decrease in cleaning**
- **20% decrease in creeling**

By WILLIAM G. ASHMORE, Associate Editor, TEXTILE WORLD

IMPROVEMENTS in the spinning room at Beaumont Div., Spartan Mills, Spartanburg, S. C., increased production 12%, reduced over-all cleaning time more than 20%, improved working conditions, and made increased work assignments possible.

Several months ago, the mill started to rebuild 94 Whitin spinning frames equipped with the Casablancas system of drafting.

The first step was to replace the 54-mm. cradle with a 36-mm. cradle. At the same time, top stationary clearers and underclearers were removed; the revolving clearers were retained. The changes, made by the mill shop, immediately improved drafting and made cleaning easier.

The next step was to install the CleanAlign drafting system. The operation involved the installation of narrow aprons and cots, ball-bearing rolls, and sealed-bearing top rolls.

The final step consisted of equipping all frames with new Pneumafil lint-free creels. [See TW, Aug. '55, p. 72.]

Setup for 12s Filling

The old operating setup on 12s filling wind was: hank roving, 0.85; twist multiplier, 3.38; mechanical draft, 14.2; spindle speed, 6,300 rpm; traveler speed, 4,100 ft. per min.; ring size, 2¼ ins.; front-roll speed, 165 rpm.

CREELING is directly onto the frame from a narrow spinners' buggy. The small trucks have a floating bottom that keeps the roving pushed up to the top of the box.

The new setup is: hank roving, 0.55; twist multiplier, 3.38; mechanical draft, 22; spindle speed, 7,047 rpm.; traveler speed, 5,073 ft. per min.; ring size, 2¾ ins.; front-roll speed, 185 rpm.

Doffing time on the modernized frames is about the same as before the changes were made, but the cost is lower because the new 10⅜-in. paper tubes hold 11 to 12% more yarn than the wooden bobbins formerly used. Approximately 0.85 lb. is placed on each tube.

Before the improvements were made, ends down on 12s filling averaged from 28 to 30 per thousand spindles per hour. End breakage now averages about the same as before; breaks occasionally drop to 18. However, front-roll speed has been increased 12½%, which means that ends down actually have decreased.

Creeling has been reduced by about 20%, largely because of the increased package size. The 12x6 packages hold 44 oz. of roving, as compared with the old 11x5½ packages that held 32 oz.

Roving is put directly onto the frame from narrow Sunray spinners' buggies. This procedure saves double handling of the bobbins; but it also has presented a roving-storage problem that the mill has not yet solved.

Head-end gears and bottom front rolls are lubricated weekly with the one-shot Bijur system. Most other moving parts have sealed bearings that require little attention.

The ball-bearing spindles are plumbed once a year. Travelers are changed every 96 to 100 hrs.

PNEUMAFIL COLLECTOR BOXES have to be cleaned once every hour, but the operation requires only a few seconds.

TOP ROLLS, revolving top clearers, and steel roll necks are picked once every 120 hrs. Estimated cleaning time per frame per week is 30 mins. Steel rolls are scoured every three months.

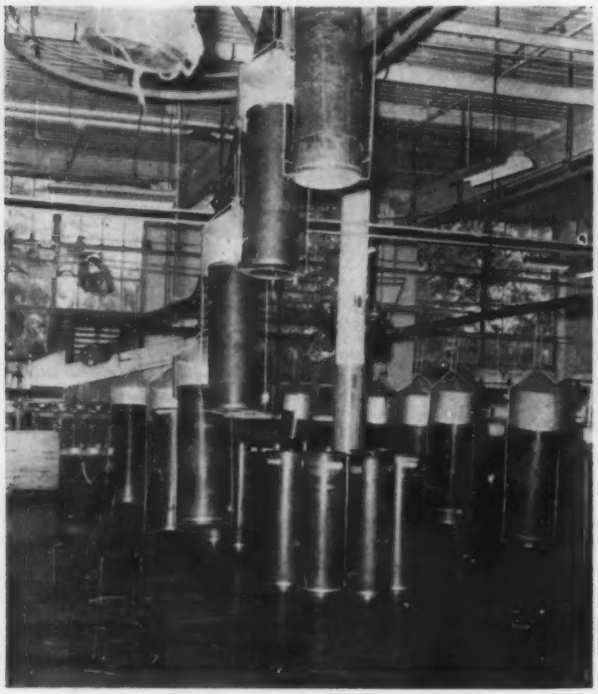
GUIDES are cleaned every 8 hrs.; the old schedule called for two cleanings per shift. Rails and rockers are brushed every 8 hrs., half as often as formerly.

Cleaning Is Reduced 20%

The Pneumafil system, overhead cleaners, and underframe cleaners have greatly reduced the time required to clean underclearers, ring rails, separators, and other parts reached by air currents.

The absence of scavenger rolls, top flat clearers, and top-roll clearers on the modernized frames further contributes to savings in cleaning. Overall-all cleaning has been reduced 20%.

On the other hand, some additional cleaning has become necessary. The Pneumafil ducts and creels have to be cleaned every two weeks, and the collector boxes have to be emptied once each hour. The latter operation requires only a fraction of a minute, but the time adds up to nearly an hour per frame during a 120-hr. work week.



CARD-SLIVER CANS coming through the ceiling from the floor above loop down at an unloading point. Empty, the carriers travel up and over the lapping machines and down to a point where comber sliver is loaded.

COMBER-SLIVER CANS are unloaded as they come from the floor below. The carriers then pass over the cards and dip at two points to allow card-sliver cans to be loaded. The system runs 15 to 20 ft. per min.

Conveyor Speeds Pepperell's SLIVER-CAN HANDLING

• With carding, finisher-drawing, and roving operations on one floor and preparatory drawing and combing on the floor below, Pepperell was faced with a costly materials-handling problem. The answer: an overhead track moving sliver-can carriers from one floor to the other.

By **MICHAEL LONDON,** Assistant Editor, TEXTILE WORLD

A CONVEYOR SYSTEM installed at Pepperell Mfg. Co., Pepperell, Ala., has cut materials-handling costs in moving card- and comber-sliver cans. Congestion around the elevator has also been eliminated.

At Pepperell, carding is done on one floor, breaker drawing and combing on the floor below, and finisher drawing and roving on the same floor as carding. Before the conveyor was installed, it was necessary to drag the card-sliver cans to the elevator and bring them to the floor below; comber sliver had to go back to the elevator, be brought to the next floor, and dragged to finisher drawing. The conveyor system does all this moving efficiently, with a minimum of personnel effort.

The conveyor is approximately 1,300 ft. long and has three drive units and a drive-synchronization mechanism. The unit runs from 15 to 20 ft. per min. Approximately 600 cans are suspended on the conveyor; so the floor space normally taken up by the cans is freed for production.

Composed of an endless overhead track on which the carriers for sliver cans hang, the conveyor system serves the entire carding, drawing, and combing areas. The can holders are frames into which the cans are tilted to sit back securely against the back of the holder.

The system travels over the cards and loops down at two points to allow the card sliver to be loaded. It then goes around the roving frames and down through the floor. On the floor below, it is lowered behind breaker drawing to allow the card sliver to be unloaded. It then travels up and over the lapping machines and down to a loading point for the comber sliver.

Loaded with comber sliver, it goes through the ceiling back to the next floor to an unloading place for the comber sliver. The track continues over the cards, and the cycle is repeated. Cans are loaded and unloaded as they move.

A TUBE is formed by sewing the cloth together on a bias. The lap position controls the tube diameter.

PNEUMATIC CYLINDER (arrow) pulls the tube around the cloth to be wrapped. The operation is fast and easy.

Woven Cloth Replaces Burlap For PACKAGING GRAY CLOTH

Problem: A shortage of burlap to wrap cloth rolls
Solution: A mill-made substitute woven from waste filling
Result: The substitute proved to be so good that it replaced the original

By **RICHARD B. PRESSLEY,** Associate Editor, TEXTILE WORLD

HARTWELL MILLS, Hartwell, Ga., had trouble several years ago getting burlap to cover gray cloth to be shipped to its finishing plant. During the burlap shortage, the mill developed a new packaging method to use cloth woven in the mill for a cover. The new method has worked so well that burlap is no longer used except to wrap gray cloth that's sold.

The cloth that replaces burlap is woven on a loom set aside for that purpose. A 40-in. E-model loom with a Brown spring-top harness motion equipped for four harnesses is used to weave the cloth.

Warps for the loom are selected at random from the stored warps to be used in the regular bagging cloth woven at Hartwell. From 1,500 to 1,600 ends are placed in a warp.

Bad Filling Is Used

Filling yarn ranges in number from 18½s to 23½s. The filling is soiled or damaged. All soiled filling dropped on the weave-room floor is woven in the loom. Pieces of filling taken up from the quill cans are used. Bad filling made in spinning is also used in the loom after it's shown to the overseer of spinning.

The cloth is woven double width at the loom. Basically, the fabric is a two-harness weave; but since the loom has four harnesses, two pieces of cloth are woven. The cloth is joined at one edge and has two selvages at the other edge. As a result, the woven cloth is 80 ins. wide, although the loom is only 40 ins. wide.

The loom is located in a regular set of looms and is tended by the regular weaver as he makes his rounds.

Packaging Cloth Is Cheap

Only 10 to 20 ppi. are put in the cloth. The resulting cloth is fairly inexpensive, but it's strong and dense enough to protect a roll of cloth during shipment.

The woven cloth is taken to the cloth room and is held until it's needed for packaging. When a roll of cloth is needed, it's wound off a reel.

The cloth is stitched on a sewing machine to form a tube. Any size of tube needed can be made by stitching the cloth selvages together on a bias to form a spiral tube. Gray cloth is shipped in rolls approximately 30 ins. in diameter, with about 1,500 yds. of cloth to the roll.

Homemade Tools Do the Work

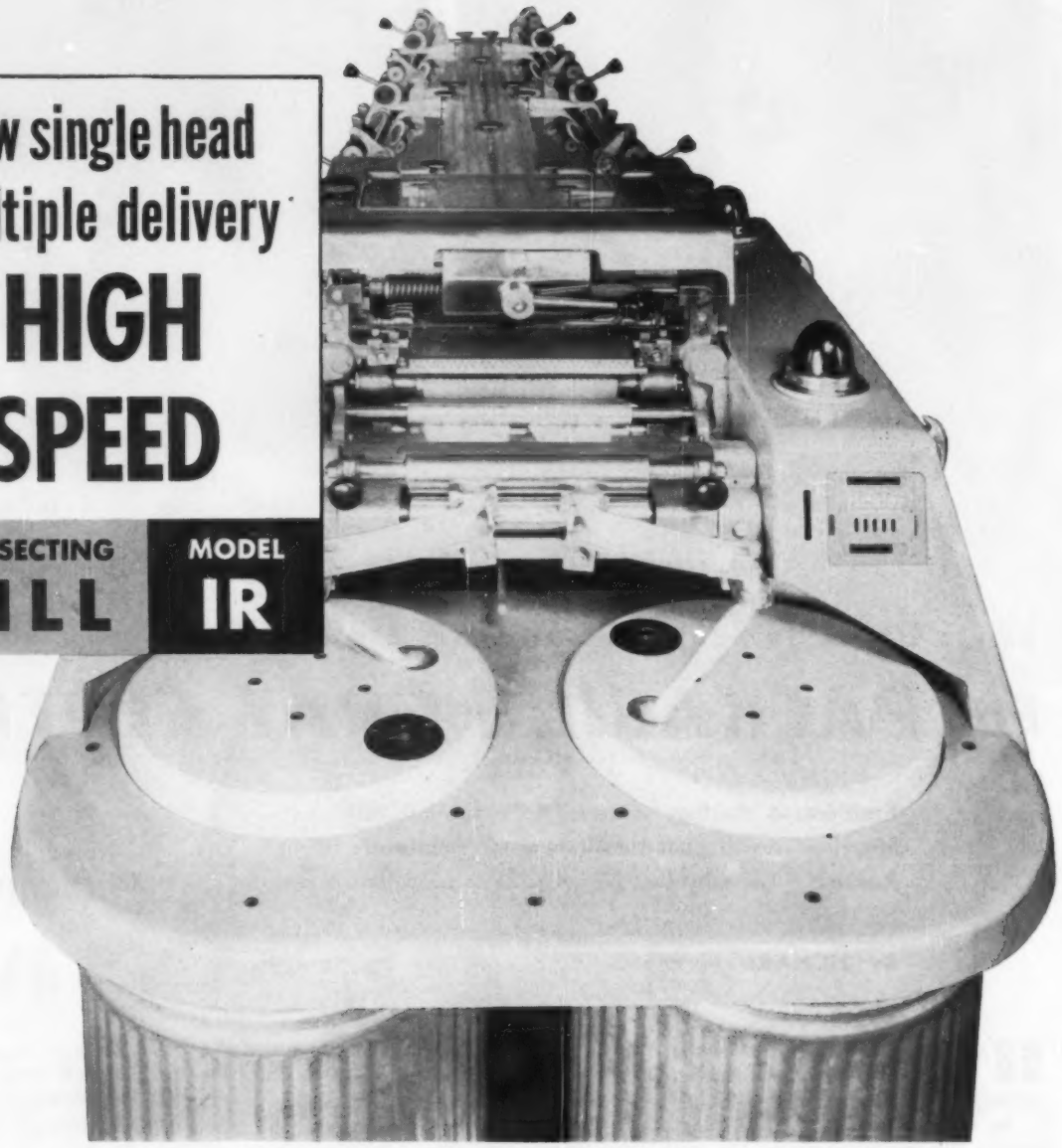
When a 1,500-yd. roll of cloth is to be shipped, a section of the tube is slipped over the entire roll. Then a wire seal is wrapped around the open end. The other end of the tube is given a couple of turns around a large hook connected to a piston on a homemade pneumatic cylinder fastened to the building ceiling.

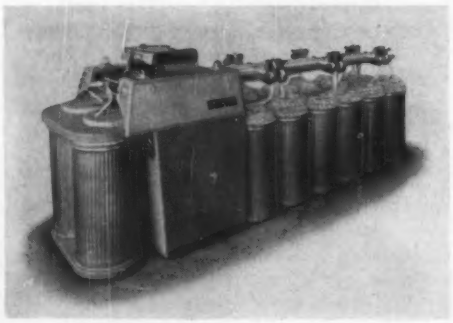
An air valve is opened, and the cloth is lifted off the storage platform. The cloth tubing is stretched taut; and while the cloth is suspended, another wire seal is put on the other end of the tube. The air is released from the cylinder, and the cloth is dropped gently to a hand truck. Then the tubing is cut off just outside the wire seal.

The bagged cloth is stenciled on the outside for identification. There's no lifting by hand.

New single head multiple delivery HIGH SPEED

INTERSECTING GILL MODEL IR





This new Intersecting Gill Box has been designed by SACM to produce quality sliver for the abbreviated systems of spinning. It can be furnished to deliver a single end into one, two, or three cans or bi-coil into two cans; also, with either ball or can creels.

✓ The head has been engineered for high operating speeds. Patented triple thread screws and fallers have the strength for high speeds. The three-roll delivery unit has a patented weighting system with balanced, single spring action.

Stop motions with indicating lights detect a missing sliver at either the feed or delivery end; also, in the case of lapping in the drafting unit or in the coilers, or in case the fallers come in contact with the plate protecting the top roll.

✓ The yardage counter automatically stops the machine when the required length of sliver has been delivered. Every precaution has been taken to protect the operative and machine against injury.

Please write for illustrated literature.

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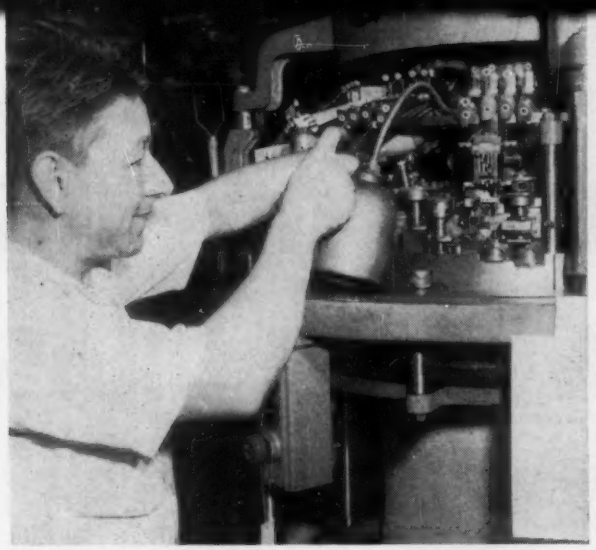
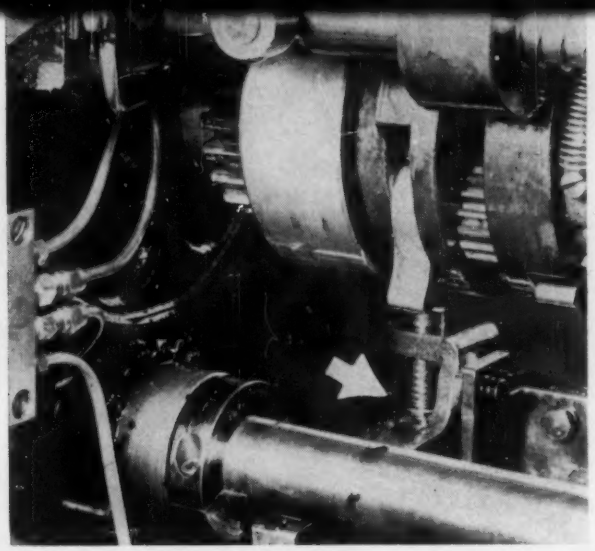


AUTOMATIC LUBRICATORS are filled daily. Needles in the dial and cylinder are oiled every 10 mins.



GEAR-BOX LUBRICATOR (arrow) is driven from the drive shaft to continuously oil the three drive gears.

AUTOMATIC LUBRICATION
Saves Time and Money

• Modern textile machinery demands exact quantities of oil. Too much oil stains the fabric; too little causes mechanical failures. A Philadelphia knitting mill solved the problem with automatic lubricators.

By JAMES H. BLORE, Associate Editor, TEXTILE WORLD

FINE-GAUGE knitting machines need constant controlled lubrication to do the best job. Some knitters tend to overlubricate their machines and receive complaints about stained fabrics. Other knitters don't find time to oil, or they forget to oil their machines. Broken needles, bad cloth, and worn parts result.

Shelley Knitting Mills, Inc., Philadelphia, Pa., has tackled the problem on its 16 ½-cut TAI Jacquard machines with automatic lubrication systems built by Bijur Lubricating Corp. The device has saved knitters' time and helped to produce cleaner sweater fabrics. Production is better because the downtime for repairs and replacements is less.

Knitters were responsible for lubricating 12 different points on the machine; needles and cams were oiled each hour. Since the lubricating systems were installed, knitters are responsible for only five lubricating points, which are attended every 24 hrs. The needles and cams are now oiled at regular intervals from a Bijur reservoir and pump unit screwed to the dial cap.

Unit Is Filled Daily

The reservoir holds 80 cc. of oil and is filled each day by the knitter from a pump oil can. An indicator on the unit shows when the oil supply is low. Regular needle oil is used in the reservoir.

Pressure is built up in the unit by a small pump operated by cams on the stationary hub of the machine. Shelley Knitting Mills finds that four cams screwed to the hub are enough for good lubrication of the Jacquard machines.

A roller on the end of the pump lever rides on the cams, and enough pressure is built up every 10 mins. to deliver oil to the vital parts of the machine.

The oil is pumped through pipes to a valve on the dial bracket. This valve meters oil to both cam tracks in the dial and to the cylinder cams. The same system also meters oil to the two bearings on the dial cap.

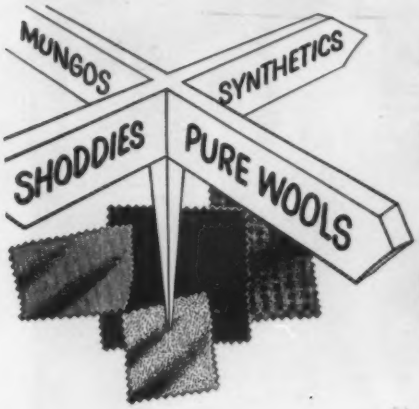
An oil jar under the cylinder-gear ring collects oil that falls down the cylinder slots. The jar, which is occasionally emptied, prevents this oil from dripping on the fabric and lower part of the machine.

Drive-Shaft Gears Are Automatically Oiled

Lubrication of the drive-shaft gears is also done automatically. A heavy grease was formerly used for this job, but now the gears run smoother and are kept in better shape with a constant flow of 20-SAE oil. After eight months of running, the gears are still in as good condition as when they were new.

A pump screwed to the gear housing is operated by a cam on the main drive shaft. The oil is pumped from the bottom of the gear housing to a meter unit. This unit lubricates the three gears in the gear box. Copper pipes are directed at the mesh of the gears. Oil runs along the shaft from the gears to keep the bearings well lubricated.

Additional oil is added every month. A small window in the housing shows the oil level. The oil in the gear box will be changed after one year's running.



PLATTS DEVELOP

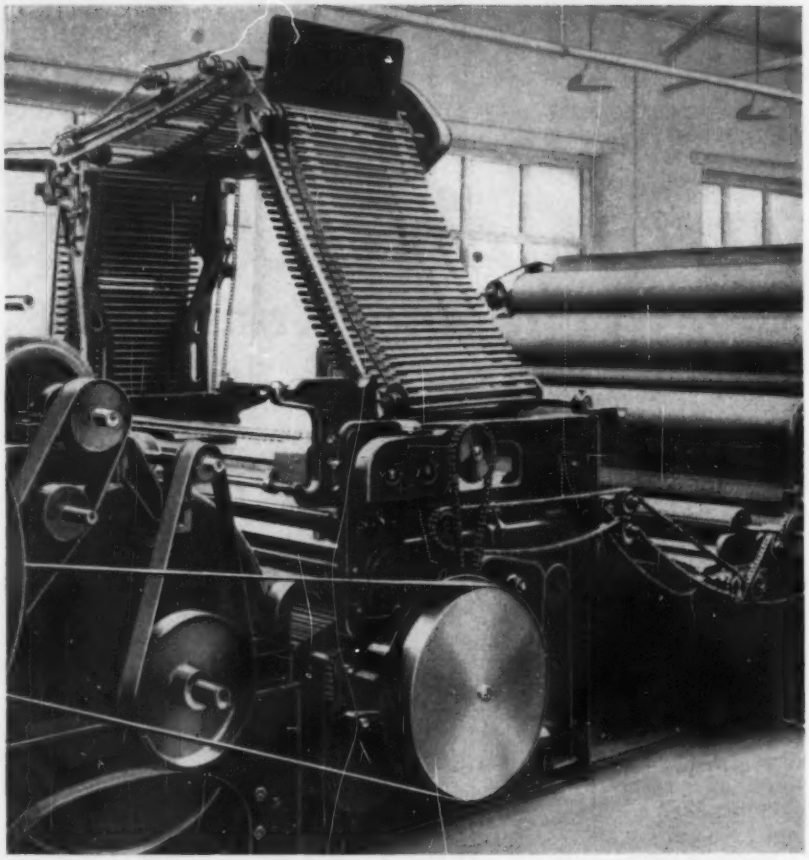
wider markets for woolen mills

To enable a mill to compete for business in *all styles and markets*, equipment of maximum flexibility to process the widest range of counts and qualities is necessary. Were the trade divided into sections—one using pure wools, the second producing mungos and shoddies and the third the various man-made fibers, a suitable type of equipment could be developed for each. Usually, however all these fibers are processed in the same mill, either straight or in blends, and the choice of the most suitable carding set assembly is anything but simple.

WORKING POWER. Here is the very basis of carding flexibility. This present age demands more and more *special feature blends* and cards having adequate working power, adjustable to suit blend variations, are the most successful ones.

INTERMEDIATE FEED. However well the modern blending units operate, the fiber orientation essential for the production of a completely homogeneous web cannot be achieved without the additional aid to blending given by the card itself. If to this is added the extra blending power of the straight fiber broad band feed, then excellent results can be assured. Mills formerly worried by "shady" pieces have eliminated this fault altogether by installing this type of Platt feed.

FOLDED WEB. The success of this feed is based on the fact that the web is taken from the scribbler back doffer and laid full width on the bottom lattice. It is folded either into 7 or 14 layers, as desired, and is then fed in this form across the feed lattice of the card. It is this folding that gives the machine its blending power. In addition, it also reduces side-to-side variations across the machine. This Platt feed is made in various widths to suit existing cards and requires little extra power to operate.



PLATT STRAIGHT FIBER BROAD BAND FEED incorporated in a carding set, with synchronized push button control, whereby the whole set starts up as a complete unit.

WIDER SCOPE. Being the world's largest manufacturers of textile machinery, we have surveyed nearly every type of mill in nearly every country. It is a rare mill indeed that cannot economically widen its markets by modifying its carding equipment. We invite you to consult with our engineers.

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A TRUE STORY — No. 3 of a Series

COMBERS AT HIGHLAND are the older E-models, front, and the new Js at the back. Noil, inspected here by B. J. Mallard, assistant superintendent, left, and F. O. Whitt, overseer, is removed by the Js at the rate of 14%. Es take out 15%.

Highland Compares New and Old COMBERS

- New Whitin Model-J combers at Highland Cotton Mills are producing at double the rate of the mill's Whitin Model-E combers. The yarn quality is higher and the percentage of noil lower.
- Here's a comparison of the features of the two types of combers —

By W. A. THOMASON, JR., Textile Engineer

HIGHLAND COTTON MILLS, High Point, N. C., installed eight new Whitin Model-J combers early in 1954. These combers replaced D-4 combers. The mill reports excellent results from the new combers.

They are running at 150 nips per minute and have a net production of 28.9 lbs. per hr. This production can be increased if more production is needed. They are removing 14% noil. The 14-in. bi-coil cans hold 20 lbs. of sliver.

Older Model-E combers still in use run at 96 nips per minute, have a net production of 14 lbs. per hr., and remove 15% noil from the same cotton. The 12-in. cans on these combers hold 14.6 lbs. each. The mill has 18 of these Model-E combers. All 26 combers are run by two operators.

Tests run to compare the Model-J combers with the Model-E combers show that the sliver from the Model Js is 30% more uniform than the sliver from the Model Es. Yarn spun from the Model-J sliver is stronger and more even than yarn spun from the Model-E sliver.

The mill is therefore channeling sliver from the Model Js into the finer yarns, where the superior qualities can be used to greatest advantage.

Here Are Production Details

Laps for both types of combers are prepared on sliver lappers and ribbon lappers. The card sliver weighs 52 grains per yard and is carded at 7½ lbs. per hr.

For the Model-J combers, the sliver laps weigh 700 grains per yard and the ribbon laps weigh 740 grains per yard. For the Model-E combers, the sliver laps weigh 620 grains per yard and the ribbon laps 630 grains per yard.

Drawing after combing now consists of two-process four-roll drawing, six-ends-up. Most of the frames are equipped with cushion top rolls, although a few deliveries have metallic rolls. The mill has completed tests on several new-type drawing frames, and it plans to install new drawing in the near future. Tests indicated that the new drawing can be run at 150 ft. per min. with no bad effect on quality or machine performance.

The mill has 11x5¼, 10x5, and 9x4½ Whitin Inter-Draft slubbers. It also has 9x4½ and 7x3½ speeders. Changes are being made to increase spinning drafting limits, and new drawing frames will permit the mill to use one process of roving on all yarn sizes coarser than 30s.

The mill spins a range of carded and combed yarns from 6s to 80s single and ply mercerized yarns and has its own dyeing and finishing plant. Spinning frames are 3¼-, 3½-, and 3¾-in. gauge. They are equipped with Whitin Casablancas drafting.

A TRUE STORY — No. 3 of a Series

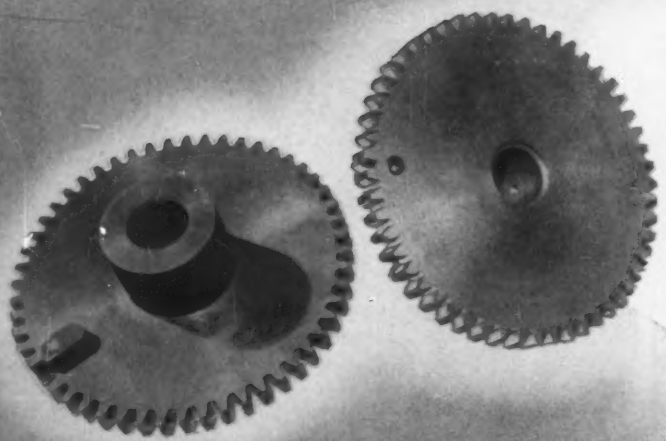
Which is the Best Money Value?

THIS GEAR *is "foundry made."*

- IS INFERIOR IN DESIGN
- ROUGHER IN FINISH
- WILL HAVE A SHORTER LIFE
- IS HIGHER PRICED

"Foundry made" substitute

THESE FACTS TELL YOU WHY THIS SACO-LOWELL GEAR IS YOUR BEST MONEY VALUE:



Genuine Saco-Lowell 53T Knock-Off Gear For 90 Pattern Pickers

1. **THE SMOOTH SURFACE** of the Saco-Lowell 53T Knock-Off Gear for 90 Pattern Pickers attracts less lint and grease over longer periods of time.

2. **THE HUNTING TOOTH** of the Saco-Lowell gear sets in a recess milled in the side of the gear. The shearing action at the knock-off is thus absorbed by the recess and a single tight-fitting cap screw — not just by two rivet-type pins alone as in the foundry gear.

3. **THE HEX SOCKET-HEAD CAP SCREW** of the Saco-Lowell gear is sufficient to take all lateral stresses because the tooth and gear are jig-drilled at the same time. The non-standard hunting tooth will soon loosen.

4. **THE INSIDE SURFACE** of the *foundry-made* hunting tooth is deep cut and appears to have been rough-filed to conform to a larger male hunting tooth, which must also be provided by the foundry — all at extra cost.

5. **AND FINALLY** — The initial cost of the Saco-Lowell 53T Knock-Off Gear for 90 Pattern Pickers is *lower* than the inferior "cost saving" substitute.

CONTINUED EVIDENCE THAT IT PAYS TO USE GENUINE SACO-LOWELL REPAIR PARTS

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POINTERS for SUPERVISORS

What Should You Do About An Employee's Personal Problems?

The more your workers trust and respect you, the likelier they are to bring their private troubles to you. You can't afford to meddle in their personal affairs, but you make a mistake if you shrug off their problems as being none of your concern.

In such a spot, what can you do? Here's a humane and commonsense answer from a man who has faced the problem in his own job.

By W. C. WESTBROOK, Consulting Editor, TEXTILE WORLD, and Overseer of Weaving, Trion Div., Riegel Textile Corp.

Not long ago a young lady with a problem came into my office. She had been employed as a batteryhand for about a year and had worked a week's notice; all she needed now was my signature on her settlement slip.

As I reached for a pen, she picked up the slip, crumpled it in her hand, and started to throw it into the wastebasket. Clenching the wad of paper, she asked me a point-blank question: Would I tell her whether it was best for her to quit or to continue working?

I already knew part of the story and with a few questions learned the rest:

She had married at the age of 15, her husband being about 25 at the time and divorced from his first wife. She was now 22, the mother of three children, and still looked very much like a candidate in a high-school beauty contest.

Her husband was the sort of fellow who never grows up; he wanted all the joys and comforts of married life without any of the responsibilities. He had been an employee in the mill but could not get along with his supervisors or fellow-workers. After being tried on a number of jobs by different supervisors, he was finally discharged for insubordination.

He had gone to a Northern city and sent for his family, with glowing accounts of the good job and fine apartment he had found. Shortly thereafter he lost that job and deserted his wife and three small children in a strange town hundreds of miles from home. The girl had returned home with borrowed money, obtained a job and a divorce, and was now independent and self-supporting.

Here was her problem. Her ex-husband had enlisted in the Army and claimed to be a changed man. He was now on furlough and wanted her to remarry him and return with him to the army post. She had agreed; but now that she was about to take the decisive step, she was assailed with doubt—and she wanted me to tell her what to do.

Although she could exercise a woman's privilege of changing her mind later, I knew that she was in such a state of indecision that the scales could be tipped either way with just a few words.

If she did not remarry him, she faced the prospect of rearing her children alone or of marrying someone else—and a widow with three children, regardless of how beautiful she is, does not receive proposals of marriage very often. On the other hand, a remarriage could be leaping from the frying pan into the fire. If her former husband's claims of being willing to assume the responsibilities and duties of a family man were false, she might find herself in worse circumstances than before. The future happiness and welfare of five people were at stake, and the question could not be lightly answered.

But what a spot for a supervisor to be in! She was asking me, in effect, to decide the future course of her own life and that of her children. She was asking me to assume the responsibility of either depriving the children of a father's care or giving them into the custody of a man who would not care for them.

It was no wonder that she didn't want to make that kind of decision for herself and so had turned to me for help. But for the very reasons that made her shrink from making the decision, I could not make it for her. Precisely because what she did was so critical for her and for her children, I could not tell her what to do.

The best answer I could give was that she was a mature woman and that she must consider all angles of the situation and make her own decision. With an assurance that she could get her job back if she changed her mind about remarriage or if the marriage was unsatisfactory, she had the settlement slip signed and left. I have not heard from her since, so evidently her decision was right.

CONTINUED ON PAGE 153

POINTERS FOR SUPERVISORS CONTINUED FROM PAGE 151

Supervisors are often faced with problems such as this theories or opinions.

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DL=Day Letter
NL=Night Letter
LT=Int'l Letter Telegram
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W. P. MARSHALL, PRESIDENT

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THE COMPANY WILL APPRECIATE SUGGESTIONS FROM ITS PATRONS CONCERNING ITS SERVICE

SOLVAY

POINTERS FOR SUPERVISORS CONTINUED FROM PAGE 151

Supervisors are often faced with problems such as this one. It is a natural human trait to confide in someone and seek advice. Many people go to their supervisors with personal problems, and rightly so. Supervisors are leaders, and most of them reach a supervisory position by their ability to solve problems and make decisions.

The big question is: To what extent should a supervisor meddle in the personal affairs of his employees?

There can be no set rule, but the supervisor who shrugs off all the personal problems of his employees as being none of his business is neglecting one of the best props for good employee relations. A few pointers for handling such situations are:

1. Be a good listener. If an employee comes to you with a problem, hear him out. Ask a few pertinent questions to show your interest. Many of these problems require no decision on your part; often the process of talking out a problem will also present a solution, and bringing it out into the open will also cause it to assume less-alarming proportions.

2. Never form snap judgments. If a decision is required, get the whole story and try to deal with facts, not with theories or opinions.

3. Don't meddle or offer unasked-for advice. If an employee has a personal problem that is interfering with his work, it is all right to point out the consequences of his actions as they apply to his job; but don't pry into his off-the-job affairs.

4. Don't violate a confidence. Although what an employee tells you may be common knowledge, don't discuss it with others except those directly concerned. The supervisor who stoops to gossip quickly loses the respect of his employees.

5. Don't set yourself up as a seer who sees all, knows all, and tells all. In dealing with personal problems, work with the other person as a friend, not as a judge and jury.

The textile industry is unique in that many of the employees and their supervisors have lived as friends and neighbors most of their lives. Although this industry is far behind some others in some respects, this relationship between supervisor and employee is a valuable asset. A second hand or overseer who can sit down with an employee and help him with a personal problem is practicing the finest kind of human relations.

PARALLEL PICKERS CONTINUED FROM PAGE 97

leather stop for the picker stick. When the picker is paralleled later with the adjusting screw ($\frac{7}{16}$x1$\frac{1}{2}$ in.) the $\frac{1}{16}$-in. up-and-down movement will be changed. However, the minimum movement after the adjustment is $\frac{1}{8}$ in., and the maximum movement is $\frac{1}{4}$ in.

Be sure the picker-stick-spring assembly is in good condition and greased properly.

Insure Shuttle Boxing

Adjust the spring for the picker stick so that it pulls the stick back against the checkstrap when the stick is released from its forward position. Avoid too much tension, because the shuttle will be hard to box.

To further insure shuttle boxing, see that: (1) the sweep stick is not too long, (2) the lug strap is not binding in the power strap, and (3) the picker stick does not bind against the bobbin chute.

Check the leather in the front stop for the picker stick for wear. A worn leather will pull the picker stick to one side at the end of the power stroke and pick the shuttles out of true shuttle flight.

Use a $\frac{3}{4}$-in. open-end wrench and hammer to drive the picker down on the picker stick. Leave the picker approximately $\frac{1}{8}$ in. too high at the back. Then check the picker's position to the shuttle at the front. If the picker is not $\frac{1}{8}$ in. too high at the front, set the adjusting screw in the picker-stick shoe to equalize the picker at the front and back. When the adjusting screw is run in to raise the picker at the front, it is also lowered at the back at the same time. And when the adjusting screw is run out to lower the picker at the front, the back of the picker is raised. Therefore, think of both the front and back of the picker when an adjustment is made to parallel it.

After the picker is equalized fairly closely at both the front and back, drive it down on the picker stick slowly. Check the picker for being parallel as it is being driven down. Then when the picker is all the way down to its correct position, the shuttle point is straight in the picker hole at the back and the point of the shuttle is raised $\frac{1}{32}$ to $\frac{1}{16}$ in. at the front position. This setting must be close with no tolerance allowed.

It is okay to move a picker stick up or down by loosening the heel bolt in the picker-stick shoe to reparallel a picker if a new stick and picker are not being put on; but the minimum of $\frac{1}{8}$-in. and maximum of $\frac{1}{4}$-in. movement must be kept.

Check and Recheck

After the picker has been paralleled accurately in the up-and-down position, put in the screw to hold the picker to the stick.

Set the rocker iron on the rocker shaft so that the picker stick is centrally located in the slot in the shuttle box plate.

Then check the picker for being parallel widthwise. With the binder and box front holding the shuttle point in the center of the box-plate slot, the picker hole must be set directly in line with the shuttle point at both the back and front.

If the picker is parallel at the back, pull the picker stick to its forward stroke against the leather stop, and check it sideways. Several faults can cause the picker to be out of line widthwise: (1) a worn picker-stick tongue, (2) crooked picker, (3) crooked picker stick, (4) worn stud or roll in the rocker iron, or (5) worn or cracked heel bolt.

It is just as important to have the picker parallel sideways as up and down.

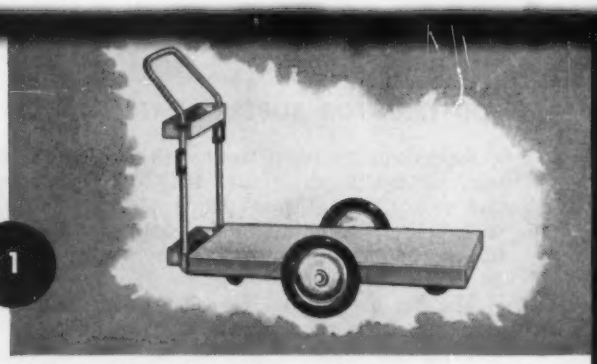
GUARANTEED HOSIERY CONTINUED FROM PAGE 123

Goods that are placed in envelopes are wrapped around a cardboard form before being placed in the envelope. The end of the envelope is then turned down and sealed with tape.

Lots of three envelopes are then packed together with a gummed paper band and placed in boxes containing $\frac{1}{4}$, $\frac{1}{2}$, or 1 doz stockings. A Markem machine is used by the shipping clerk to show the style, color, and size on the end of the box.

time studies prove it!

mobile power lubrication can slash costs...up profits... boost production!



1

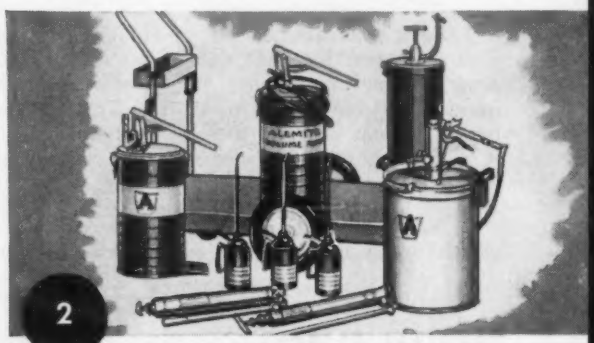
Mobile power lubrication begins with this sturdy hand truck, the Lubrikart. Highly maneuverable, it goes anywhere in the plant, navigates a 26" aisle, turns in a 49" circle.

Alemite cuts costs!

this "lubrication department on wheels" is tailored to fit the needs of your plant...exactly!

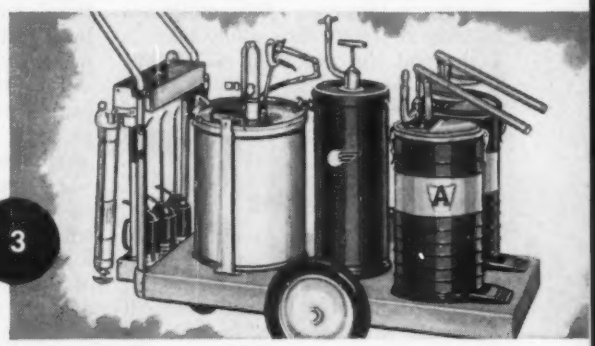
If your plant needs a wide variety of lubricants "all over the lot," an Alemite Lubrikart can save you plenty. It's actually a "lubrication department on wheels," provides all the advantages of power lubrication—proven by actual time studies to be 63% faster than hand methods!

Lubrikarts carry hand guns, electric or air operated power guns for pressure gun greases, loader pumps, gear oil dispensers, oil can fillers, as well as extra parts, tools, other maintenance needs. The savings in down-time are amazing—and even more important, you get more consistent, *better* lubrication—all along your lines of production.



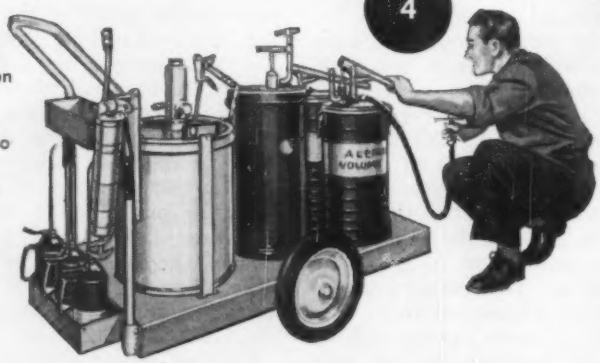
2

From standard Alemite equipment you choose the exact items your plant needs. Air, electric or hand operated pumps handle any lubricant needed. And Lubrikart brings necessary equipment right to the machine!



3

Now the Lubrikart, filled at the plant oil room, is ready to service a variety of machines requiring different types of lubricants. Lubricant is completely protected at all times — reaches bearings "refinery clean"!



4

Operator has a complete selection of equipment, plus spare parts, fittings, etc., to do a complete job —"on-the-job."

This is Alemite Plan "E" — Lubricant stays "refinery clean" barrel to bearing!

This planned assembly and use of Alemite Lubrikarts is known as Alemite Plan "E". It is one of the five Alemite plans that your trained Alemite representative can show you. Ask him about the colorful, new informative slide film, "No Margin for Error" which will help you and your men cut production costs. No obligation.

FREE! **New Booklet: "5 Plans for Better Plant Lubrication"**

ALEMITE, Dept J-125
1850 Diversey Parkway, Chicago 14, Illinois

Please send me my FREE copy of "5 Plans for Better Lubrication."

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Company.....

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ALEMITE

REG. U. S. PAT. OFF.

Ask Anyone in Industry

A PRODUCT OF SW STEWART WARNER

EQUIPMENT and SUPPLY NEWS

High-Speed Drawing Frame

A high-speed drawing frame, known as Even-Draft, has been announced by Whitin Machine Works, Whitinsville, Mass. The machine has eight deliveries; each four-delivery section is independently driven.

Front-roll speeds range from 250 to 300 ft. per min.; net production is more than 300 lbs. per hr., dependent upon the fiber run and sliver weight. The machine processes cotton and spun-synthetic blends with staple lengths of $\frac{7}{8}$ to 3 ins.

The frame is said to produce drawing sliver with a variation of 15 to 17% (2.9% Uster reading) on carded stock and 10 to 12% (2.5% Uster reading) on combed stock.

The drafting element in each delivery is a four-over-five roll arrangement similar in principle to the draw box on the Model J comber. Diameters of the bottom rolls, from front to back, are 2 ins., 1 in., $\frac{3}{4}$ in., $1\frac{3}{8}$ in., and $\frac{3}{8}$ in. With the exception of the $\frac{3}{4}$-in. roll, all bottom rolls are fluted. The four top rolls are $1\frac{3}{8}$ ins. in diameter and covered with a standard synthetic cushion.

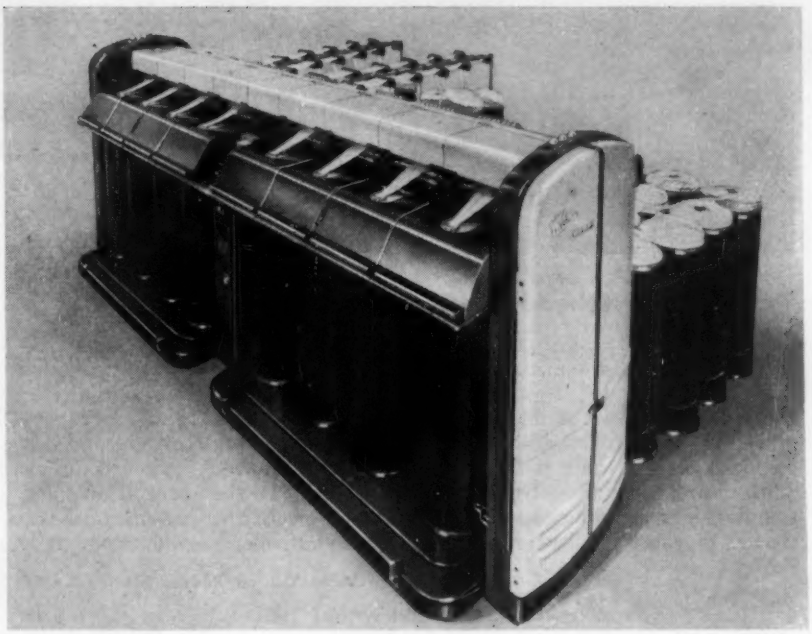
Waste is removed from the rolls and drafting area by a Pneumafil vacuum cleaner applied to drawing for the first time. The vacuum cleaner, an integral part of the frame, consists of an enclosed unit above the top rolls and a similar unit below the bottom rolls. Waste is lifted by pads extending along the rolls and removed through ducts to a collecting box in the machine. The first three top rolls and the first four bottom rolls are cleaned by the unit.

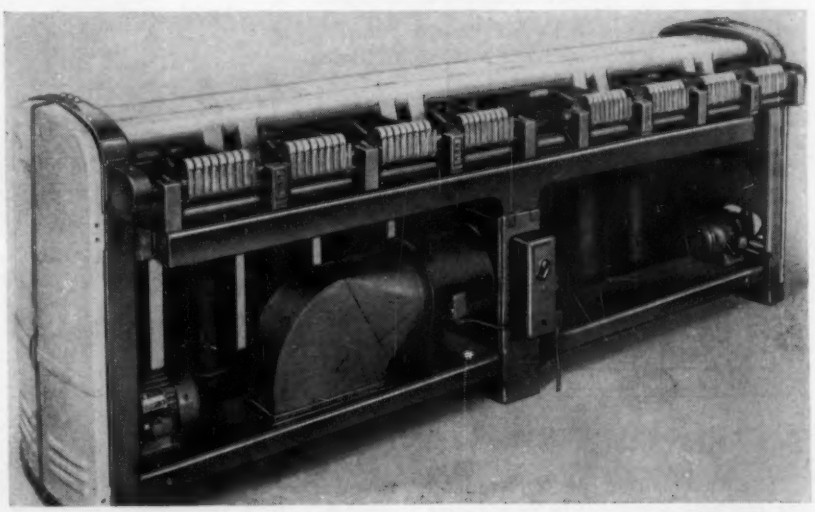
Weighting is accomplished by four enclosed springs mounted above the roll ends and suspended from two pivoted arms.

An extended creel is used with a new arrangement of the lifting rolls and sliver pan to provide full support to the sliver and reduce stretching.

Coils are built up in the cans on a special can table that does not rotate; no twist is put in the sliver. Cans are 16x42 ins. and hold from 32 to 38 lbs. of sliver.

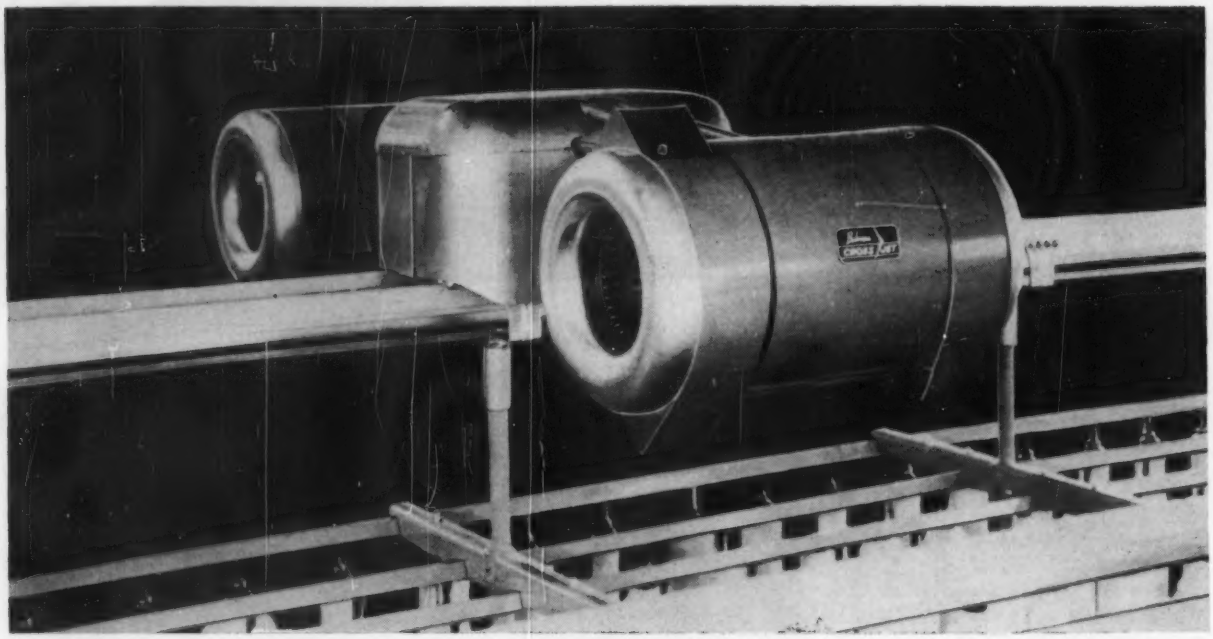
Other features are an electric stop motion, warning signal lights, six push-button start-and-stop stations, safety doors over the gearing, and anti-friction bearings.





Circle T-1 on Reader-Service Card

Ask Anyone in Industry



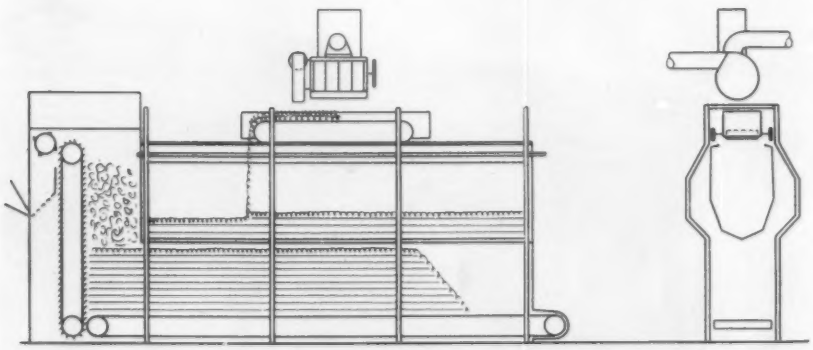
Traveling Overhead Cleaner

The Cross-Jet, a new traveling cleaner for spinning rooms, has been announced by Bahnson Co., Winston-Salem, N. C.

Self-propelled on a standard-weight creel-mounted track or on a single-rail suspended track, the cleaner's four revolving nozzles and four directional nozzles provide 360° cleaning of all overhead surfaces as well as the spinning frame. When used with open-type creels, the cleaner provides excellent cleaning of the underframe.

It is claimed that the cleaner is so efficient that only one ½-hp. unit is needed on alternate frames; installation costs are therefore reduced. Operating economy is said to result from the low horsepower requirements, efficiency of air handling, and the elimation of passages or snouts that become clogged. The machine rolls on side-guided wheels without flanges to assure positive tracking and reduce track wear. The cleaner can be installed on either old or new spinning frames.

Circle T-2 on Reader-Service Card



Sandwich Blender

The Rieter Automixer, a fiber-blending machine developed in Switzerland, is now sold in the United States by American Rieter Co., Inc., 577 Kearny Ave., Arlington, N. J. Production is 1,300 lbs. per hr.

Stock from the bale openers is dropped by a pneumatic delivery apparatus onto a rubber conveyor belt that traverses the entire length of the machine and spreads the stock in layers in the top mixing compartment. From 30 to 40 layers are laid down; the exact number is predetermined and set on a precision-built counter.

When the final layer is placed in the top chamber, the compartment automatically opens and deposits the mass of fiber in the filling or feeding chamber below. When this action takes place, an electric control interrupts the feeding from the preceding machines until the top chamber automatically closes; then feeding is resumed.

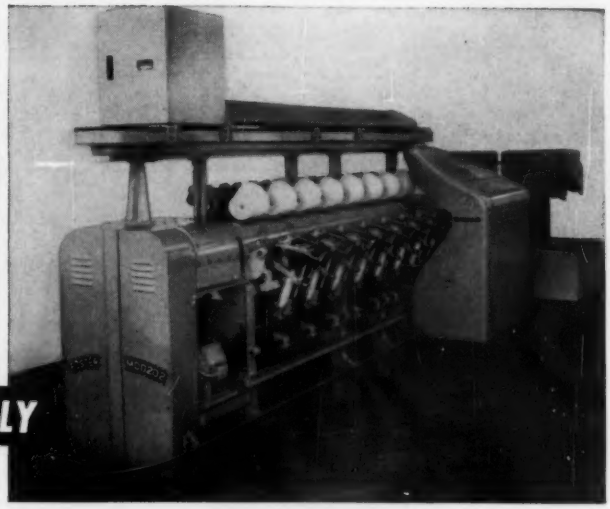
The mass of fiber, 40 ft. long and 3½ ft. high, moves slowly forward on another conveyor belt that forms the floor of the feeding chamber. At the front of the machine, the fiber is pressed against an upright lattice fitted with fine needles. These needles cut vertically through the horizontal layers. A pneumatic pipe delivers the blended fiber to the next machine in line.

The Automixer requires 6x45 ft. of floor space.

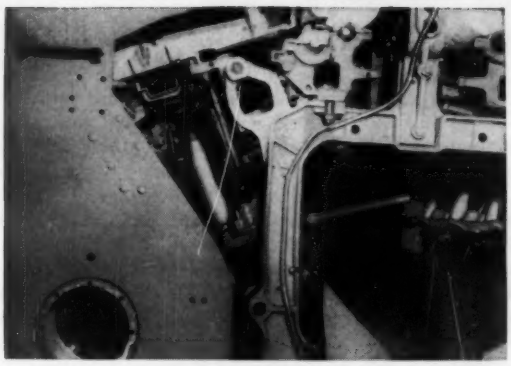
Circle T-3 on Reader-Service Card

FOSTER MODEL 202

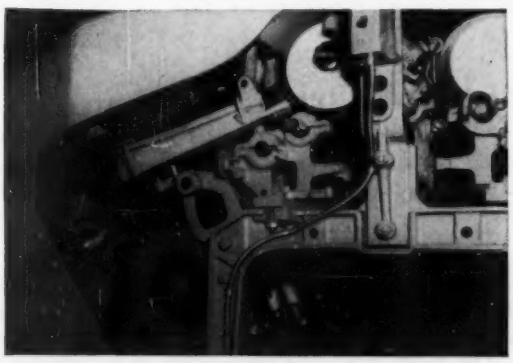
Automatic Cone Winder



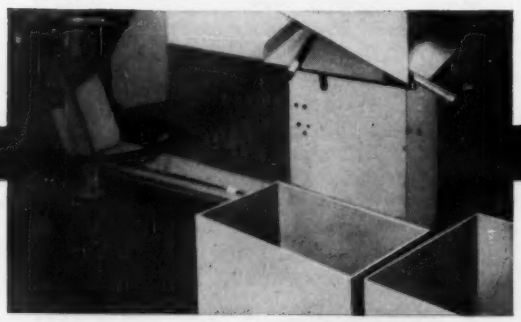
6 OPERATIONS DONE AUTOMATICALLY



Full bobbin moving automatically into supply position. Empty bobbin being doffed to conveyor.



Part of automatic tender which places loose end of cone beside loose end of bobbin and ties them in weaver's knot.



Automatic bobbin sorter depositing empty bobbins in one box and partially filled bobbins in another.

ONLY 3 DUTIES
For Operator

That's why the Foster Model 202 increases production per operator by 100% to 300% (depending on the type and count of yarn) over the best non-automatic winder and why it pays for itself in 2 to 5 years.

The automatic operations are as follows:

1. Spindle stops when end breaks.
2. Automatic tender ties broken ends in weaver's knot.
3. Spindle starts again.
4. Empty bobbins doffed.
5. Empty bobbins carried away.
6. Empty bobbins and partially filled bobbins sorted and put in separate boxes.

And here are the only duties of the operator:

1. Drops full bobbin in chute and catches end in clip in one continuous motion.
2. Dons and doffs cones.
3. Threads up new cones.

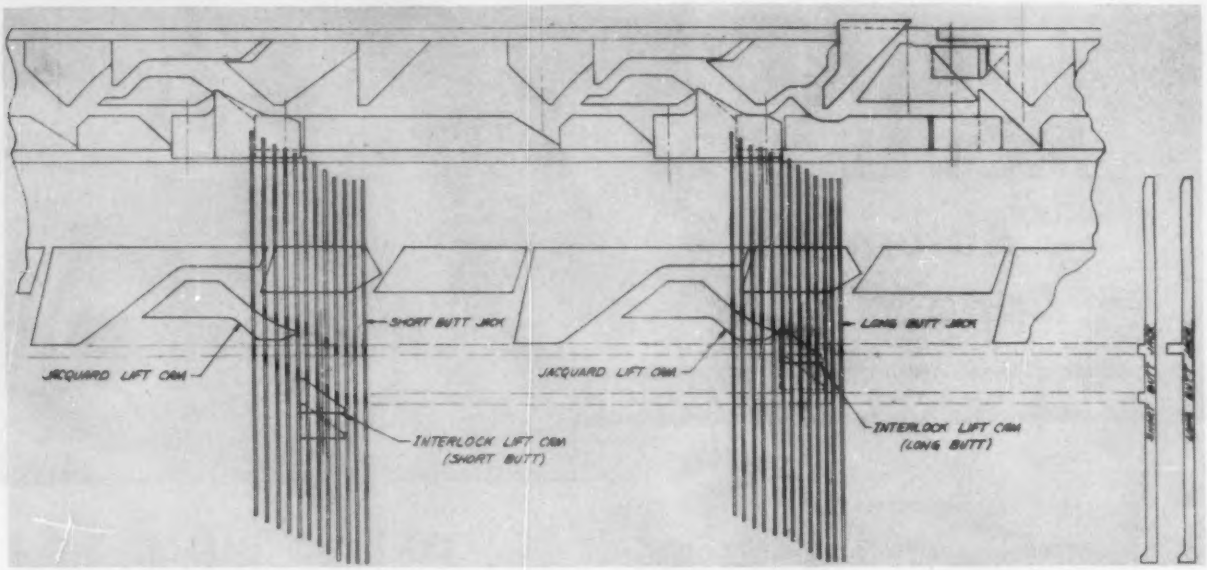
And remember, the Model 202 is the ONLY automatic machine which produces cones suitable for knitting. This is only part of the story. Get ALL the facts. Send for Bulletin A-100.

FOSTER MACHINE COMPANY

A Winder for Every Textile Purpose

Westfield, Massachusetts, U.S.A.

Southern office — Johnston Bldg., Charlotte, N. C. Canadian Representative — Ross Whitehead & Co., Ltd., 1475 Mountain St., Montreal, Que. and 35-37 King St., W., Toronto, Ont. • European Representative — Muschamp Textile Machinery Ltd., Keb Lane — Bardsley, Oldham, England.



Jacquard Knitting Machine

Model TJI-12, made by Jacquard Knitting Machine Co., Inc., Philadelphia 24, Pa., combines interlock, rib, jersey, and jacquard production. The model knits all yarns but was developed primarily for tow-dyed Orlon.

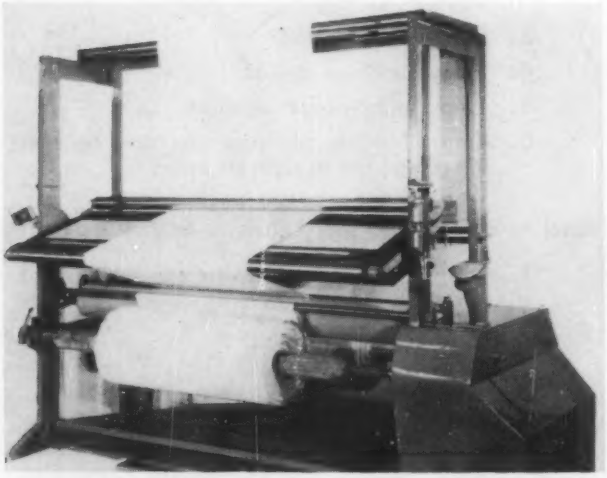
The machine comes in 30-in. dia. up to 14 needles per inch, with 12 knitting feeds and 8 transfer systems.

A separate interlock-cam arrangement allows the machine to knit interlock fabric with the jacquard mechanism. Double short-butt needle jacks and single long-butt needle jacks are used. In knitting interlock, the long-butt jack is selected at one feed by a thin raising cam. The lower butt of the double short-butt needle is selected at alternate feeds by a thicker raising cam.

In knitting jacquard fabric, the interlock raising cams are put out of action. The machine produces plain interlock, interlock with jacquard designs, plain jersey, welt fabrics, and striped fabric with 1x1, 2x1, or 2x2 cuffs.

Automatic lubrication, electronic-controlled drive, Warner electric clutch, four-color yarn changes, and three-roller fabric take-up are featured.

Circle T-4 on Reader-Service Card



Inspecting Machine

A heavy-duty inspecting machine that will take 36-in.-dia. rolls is offered by Hermas Machine Co., Hawthorne, N. J.

The frame is made of 5-in. channel steel with welded construction. A variable-speed drive works through an electric clutch. Electric brakes are adjustable to maintain desired tension on the let-off arbor. Optional equipment includes a plastic inset for the inspection table with a bank of fluorescent lights underneath.

Circle T-5 on Reader-Service Card

High-Speed Italian Loom

A loom that weaves 28-in.-wide cotton cloth at 700 ppm. is said to be in the works at the Ripamonti Works, Orsenigo, Italy. Patents are covered by Gantilini-Ripamonti. Between 20 and 40 of these looms are being tested in textile mills.

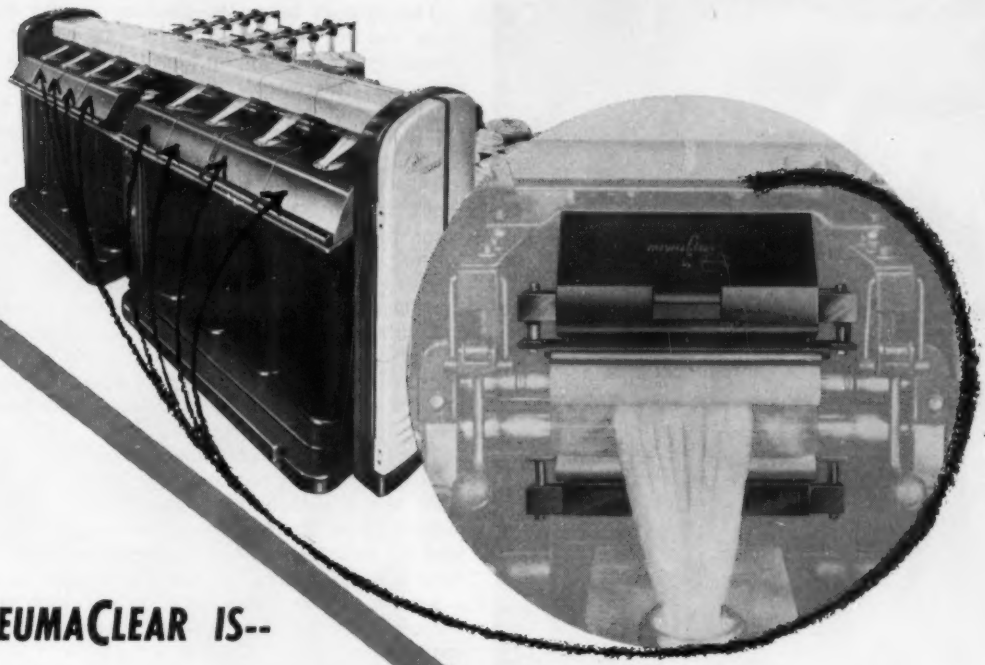
The loom weaves pick-and-pick designs with 20 to 40 colors of filling. Filling is taken from a supply package capable of lasting 48 running hours. False selvages are made with a tucking device at each edge of the cloth.

The loom runs noiselessly when it is weaving at 220 ppm.; a ¾-hp. motor is required at this speed. The loom is started and stopped with push-button controls from any one of the rectangular sides.

Fabrics woven 28 ins. wide are:

1. Jute. Weaves at 505 ppm.; 11 ppi. give 1 yd., 8 ins. of fabric per minute.
2. Sacking. Weaves at 750 ppm.; 11 ppi. give 1 yd., 28 ins. of fabric per minute.
3. Cotton, 30/2 yarn. Weaves at 700 ppm.; 38 ppi. give 18.4 ins. of fabric per minute.
4. Cotton sheeting. Weaves at 450 ppm.; 40 to 60 ppi. give 8 to 9 ins. of fabric per minute.
5. Worsted. Weaves at 500 ppm.; 40 to 55 ppi. give 9 to 10 ins. of fabric per minute.

Circle T-98 on Reader-Service Card



PNEUMACLEAR IS--

"The successful solution for the problem of removing waste fibers when such high roll speeds are used."

Quoted from Whitin's reference to the use of PneumaClear on their remarkable new Evendraft drawing frame with speeds of 2½ to 3 times that of conventional drawing frames.

Specifically . . . PneumaClear is an enclosed unit that lifts the waste fibers from the rolls by pads extending along their length. This waste is removed through ducts to a collecting box in the frame. The air is gently released back to the room near the floor.

Pads - fan - motor - collection box and all ducting - the entire PneumaClear is an integral part of the basic design.

PneumaClear is the successful solution for the problem of removing waste fibers when high roll speeds are used!

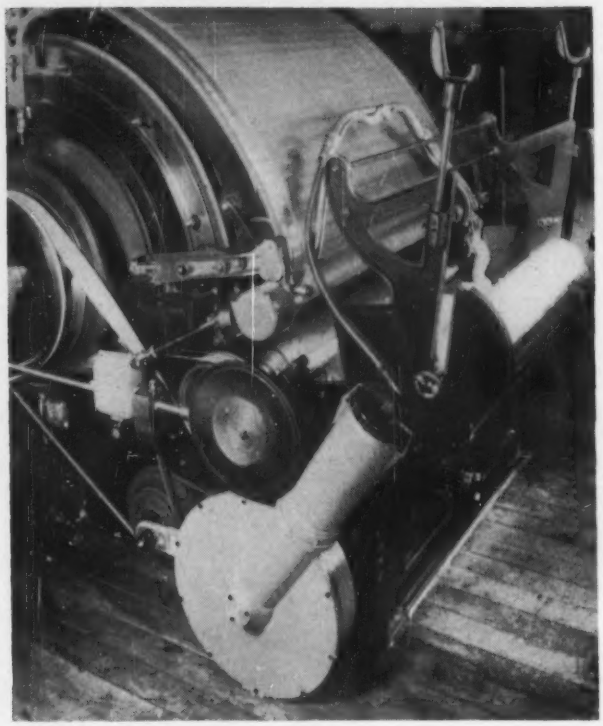
PNEUMAFIL CORPORATION
CHARLOTTE 8, NORTH CAROLINA

PneumaClear
Pneumafil Economizer Unit System
Central Air System
Central Material Recovery System
Lint Free Creel
Pneumastop ®
Pneumacard ®

PNEUMAFIL ®

PRODUCTS OF PROGRESS >>

Atlanta, Georgia *Needham Heights, Mass.*



Continuous Card Stripper

A continuous vacuum-type card stripper that reduces waste to approximately 1% of lap weight and makes manual stripping necessary only every 40 to 120 hrs. is being imported from Spain and sold by American Balmes Corp., 859 Summer Ave., Newark, N. J.

The stripper keeps the clothing on the main cylinder clean and free from clogging for long periods of time and permits greater carding uniformity. Production is increased, and neps are reduced.

The collector unit is mounted above the lickerin with the suction nozzle projecting toward the cylinder through a slot in the back plate. The unit moves slowly back and forth across the full width of the cylinder and applies a slight vacuum continuously to the fibers. This action keeps the fibers at the top of the clothing and prevents packing.

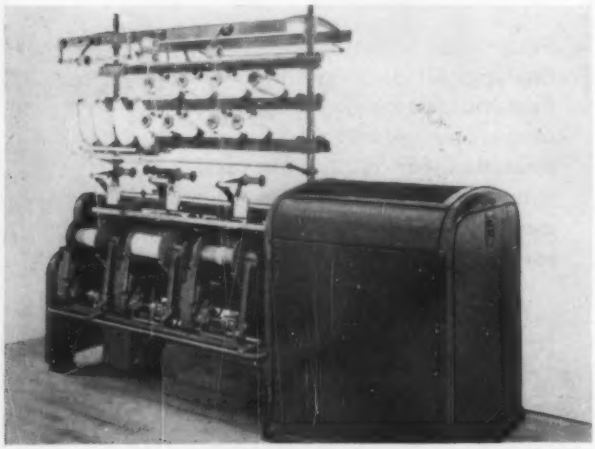
The continuous suction removes approximately 5% of the fibers from the cylinder, and a pair of rolls condenses these fibers into a sliver that is laid back on the lap evenly as the unit traverses. Dust and small particles of trash are screened from the fibers and passed through a flexible pipe to the dust container. Larger particles of seed and leaf drop below the cylinder.

The fan and dust container are mounted on the side of the card below the feed-roll gear drive. The fan is driven from the main-cylinder pulley through a pair of idler pulleys. The traverse motion is driven directly from the feed-roll drive shaft through scaled gear boxes. No separate drive is required, and the power consumed is small.

Known as the Constant Card Stripper, the device is manufactured by Cia. Ama. Constant Card, Barcelona, Spain.

*[Several years ago, an attempt was made to manufacture this stripper in the United States under license from Cia. Ama. Constant Card. The stripper proved unsatisfactory because of clogging or lapping on the condenser rolls. The trouble has been completely eliminated, according to American Balmes Corp.—*EDITOR]

Circle T-6 on Reader-Service Card



Redraw Doubler

The Spoolmatic redraw doubler just announced by Whitin Machine Works, Whitinsville, Mass., offers an economical method of increasing production of uptwisted multiple-ply yarns.

The electronically controlled machine winds one, two, or more ends onto a double-head spool to form a package that can be used to supply the Whitin Cable-King uptwister or any regular ring twister.

Yarns particularly suitable for uptwisting on the redraw doubler include rayon and nylon tire cord, cotton or synthetic tufted-rug yarns, wool and synthetic yarns for woven carpets, duck yarns, or any other heavy industrial yarns.

Production rate of the machine ranges from 100 to 300 yds. per min. The take-up package, with a maximum diameter of 8½ ins., holds 8½ to 9 lbs. of yarn. Maximum traverse is 9 ins.

The Spoolmatic is double-sided and has from 6 to 48 take-up positions in multiples of 6. Additional positions in multiples of six can be added.

Circle T-97 on Reader-Service Card

Tricot Machine

The 168-in. F. N. F. high-speed tricot machine [TW, Oct., '55, p. 159] is to be made in this country by Kidde Mfg. Co., Inc., Bloomfield, N. J. Kidde machines will be built by F. N. F. in England for European mills.

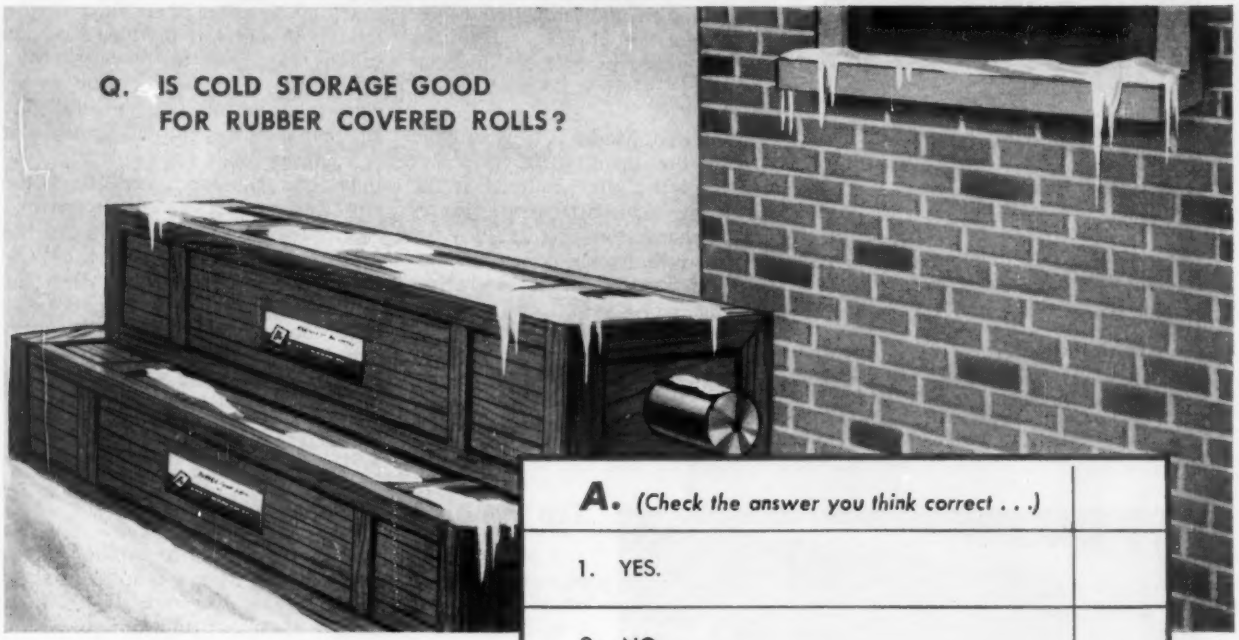
The new machine cruises at 900 courses per minute and accommodates beams with 21-in.-dia. flanges. The machine has a continuous cloth take-up with double rolls for less slippage. The cloth roller has a capacity up to 14-in. dia. Pattern wheels or chains may be used.

Circle T-7 on Reader-Service Card

EQUIPMENT AND SUPPLY NEWS

STOWE-WOODWARD Maintenance Tips

for better finishing at lower cost



A. *(Check the answer you think correct . . .)*	
1. YES.	
2. NO.	
3. VARIES ACCORDING TO TYPE OF RUBBER COVERING	

You'll find the correct answer in these Maintenance Tips

You'll avoid trouble if you check #2. Actually, cold storage itself has little effect on Stowe-Woodward roll covers . . . but the sudden change of temperature which results from moving a roll from outdoor winter temperatures to a warm room can crack the cover of a fairly hard roll . . . and a sudden change from hot to cold is equally risky. Soft rubber rolls are less susceptible to this type of damage.

To guard against such sudden and extreme changes of temperature Stonite and Microrok rolls shipped from Stowe-Woodward plants in mid-winter are packed in cork insulation.

The ideal place to store rolls is a cool, damp room, preferably dark, and positively out of direct sunlight. When rolls are removed from storage they should be allowed to stand at room temperature long enough for both the rubber and the core to reach the room temperature.

Your Stowe-Woodward Sales Engineer is qualified to advise you on any problem regarding the selection, storage care, or operation of rubber covered rolls . . . look to him when you need help.

"RUBBER ROLLS with a REPUTATION"

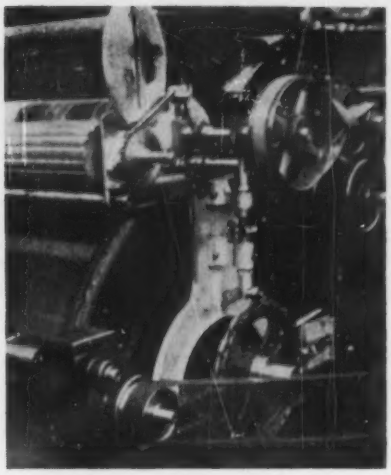
S-W INC.

STOWE-WOODWARD, Inc.

Craftsmen in rubber rolls

NEENAH, WISCONSIN • NEWTON 64, MASS. • GRIFFIN, GEORGIA

 For more information, write direct or use Reader-Service post card.



Devices for Woolen Cards

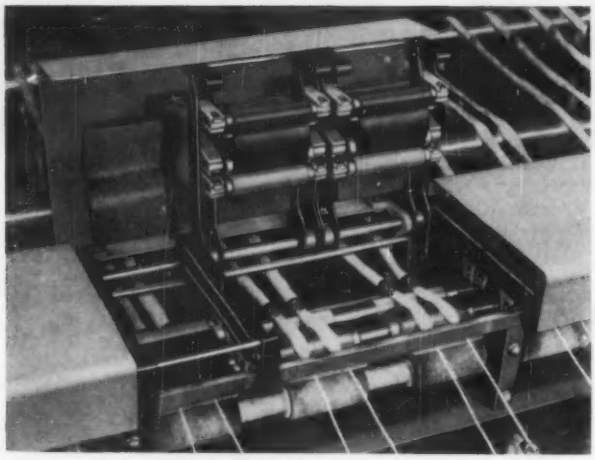
Two woolen-card attachments for the manufacture of flake yarns have been announced by Stellite American Corp., 60 E. 42nd St., New York 17, N. Y.

One device, Model A-6, is suitable only for the manufacture of flakes made from the same material as the basic yarn. This attachment causes periodic changes in the distance between the cylinder and doffer and controls the delivery of an alternately thin and thick lap. Shift cams attached to the axles of the doffer cause the doffer to move. The shift cams can be set for various sizes and lengths of flakes. If flakes are not required, the device can be easily disconnected.

Another attachment, Model A/B-6, can produce flakes from different material. It also can produce flakes in various sequences to allow two-color flake yarns to be spun. The device consists of a roll that unwinds the lap that produces the flakes, one pair of delivery rolls, and a flake roll that tears the lap pieces from the lap being guided by the delivery rolls.

The lengths and thicknesses of the flakes can be altered, and their distances can be controlled. With the Model A/B-6, the sequence of the flakes can be made regular or irregular. The device also prevents the flake material from blending with the basic fiber.

Circle T-8 on Reader-Service Card



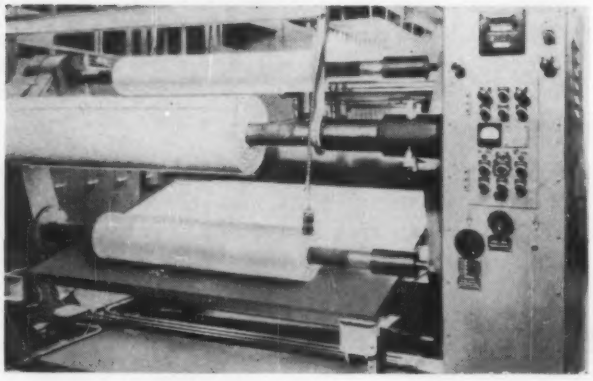
Top Apron Drafting System

A top-apron drafting system designed to handle a range of cotton staple lengths from $\frac{7}{8}$ to $2\frac{1}{2}$ ins. is announced by Platt Bros. (Sales) Ltd., Oldham, England. Drafts from 9 to 25 can be obtained with minor adjustments of the system.

Three lines of top and bottom rolls are employed. The front and back lines have fluted steel bottom rolls and covered top rolls. The middle bottom roll is covered with a large-diameter synthetic cot. A short synthetic apron carried by the middle top roll works against this cot. A tensor bar controls the apron.

This arrangement deflects the fibers from a straight-line passage between the front- and back-roll nips and exercises fiber control by the pressure of the moving apron surface against the yarn. The movement of the short fibers is retarded.

Circle T-9 on Reader-Service Card

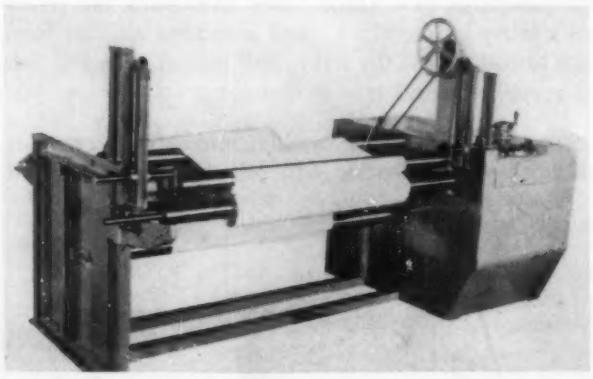


Turret Winder

A three-shaft turret winder for continuous processing of textiles has been announced by Hobbs Mfg. Co., Worcester, Mass.

Designed to wind cloth under controlled tension in rolls of pre-determined diameter, the winders are driven through an Alquist electric-clutching device. The three arbors move from winding, doffing, and reserve positions as the operation cycle is completed.

Circle T-10 on Reader-Service Card



Straight Edge Tuber

An automatic sensing device keeps cloth edges in line while they are being tubed on an improved machine that has been built by Hermas Machine Co., Hawthorne, N. J.

A pressure-roll unit smooths out wrinkles that might otherwise form during the tubing process. A variable-speed ratio of seven to one is standard. The machine will handle rolls up to 36 ins. in diameter.

Circle T-96 on Reader-Service Card

The Hottest Tip

. . . in Shuttle News!

The New "Southern" short head Shuttle Tip *for*

ADDED STRENGTH

LESS MAINTENANCE

REDUCED COSTS

Above drawing illustrates comparison between 846M and S-846M type Shuttle Tips. Note that head shape is exactly the same on both tips. The head length of the S-846M Tip is shortened, making possible increased shank length, thereby substantially decreasing the possibility of tip failure by loosening.

Due to tip complaints in the weaving industry SOUTHERN has undergone a period of constant research, development and tests to find the best material, form and method of attachment to overcome this serious problem.

RESULT...

A new tip was born—the new S-846M-5 Tip—and the world's finest shuttle "SOUTHERN" became finer than ever before.

Although the head is shaped exactly the same as its predecessor, its head length was shortened and the shank length increased, thereby increasing the surrounding holding properties by the addition of that much more wood.

Eliminate those Shuttle Tip headaches by contacting your nearest Southern Shuttles Sales Engineer for further interesting information on Southern's solutions to your shuttle problems.

Effect Your Greatest Economy By Buying The Right Product The First Time . . .

Buy Stehedco and Southern

SOUTHERN SHUTTLES

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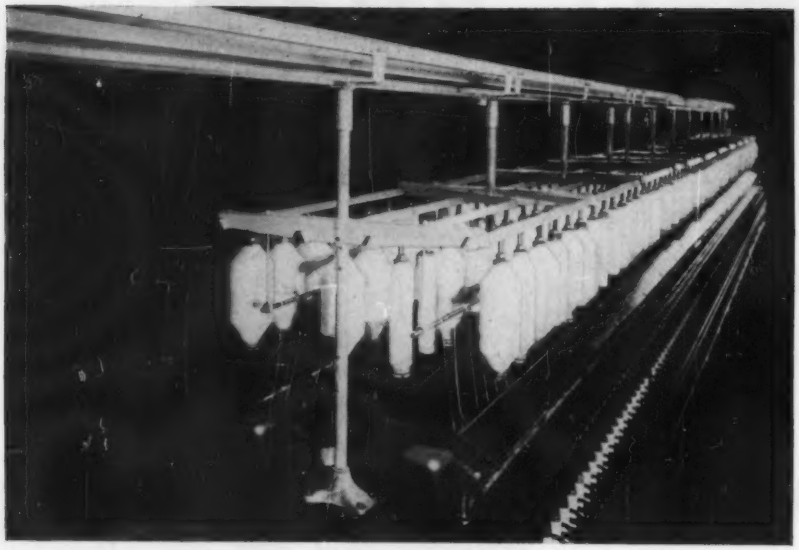
EQUIPMENT AND SUPPLY NEWS



Open Creel For Spinning

The Open-Aire Creel, featuring an improved open-top construction for easier cleaning and improved yarn quality, has been announced by Bahnson Co., Winston-Salem, N. C.

Of all-steel construction, the creel allows a direct, unobstructed air blast from overhead cleaners to reach all sections of the spinning frame. Since all top surfaces of the creel are curved and slanted, lint and fly cannot accumulate; the possibility of slubs and bad yarn is greatly reduced.

Suspension from top of the bobbin with especially designed bobbin holders permits creeling from carts. New package arrangements make it practical to run 12x6½-in., or larger, packages on frames with a spindle gauge of 2¾ ins. and up.

Circle T-11 on Reader-Service Card

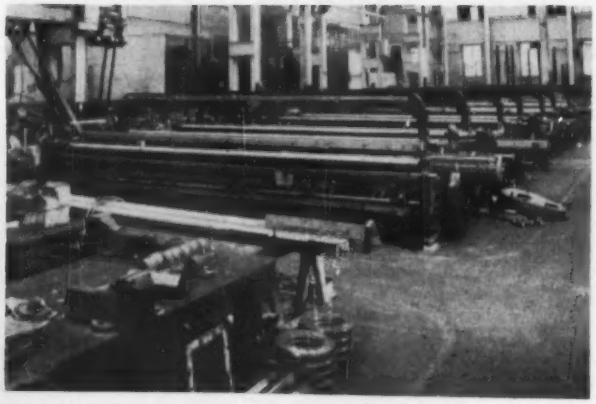
Bondable Spinning Tape

A bondable nylon spinning tape, Burnylbond, has been announced by Burlington Narrow Fabrics, a member organization of Burlington Industries, Greensboro, N. C.

The tape, said to wear three to four times as long as cotton tapes, can be formed into an endless belt by bonding without distortion at the splicing point. The splice can be taken apart and rebonded when necessary.

A bonding machine and a hot-cutting and fusing machine are available.

Circle T-12 on Reader-Service Card



Loom for Carpet Backing

Looms of heavy construction, designed to weave jute backing for tufted carpets, are being manufactured by Urquhart Lindsay & Robertson Orchar Ltd., Dundee, Scotland. The looms have various-width reed spaces between 134 and 252 ins. to weave the backing fabric for 9-, 12-, 15-, and 18-ft. carpets.

Two patterns of fabric can be woven, plain or broken twill. Rolls of cloth from 250 to 300 yds. in length can be woven at the loom in one piece. The let-off used insures equal tension on two end-to-end warp-yarn beams even when the diameter of the yarn on each beam is of different size.

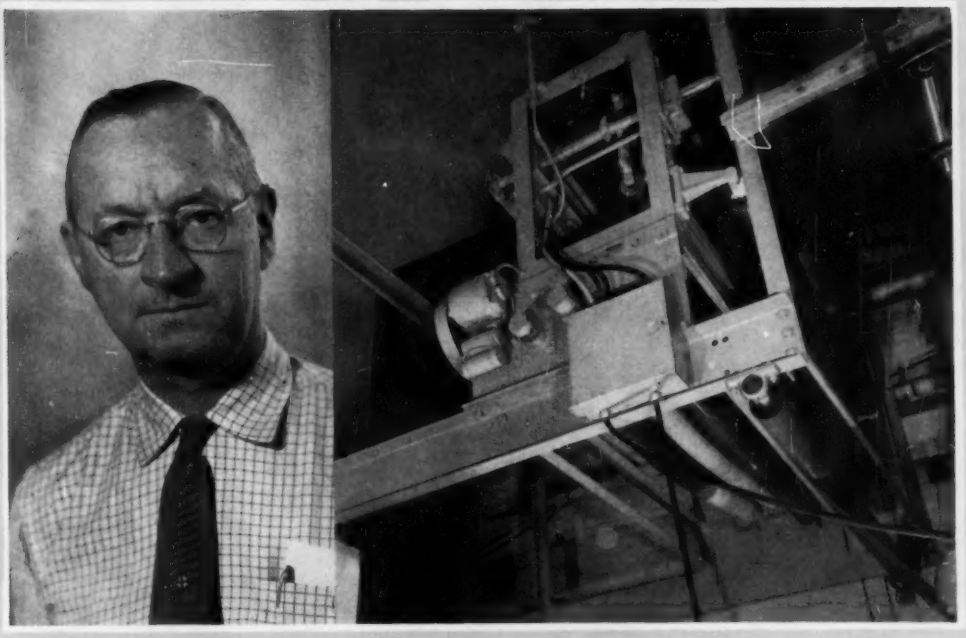
A loom with a 210-in. reed space will weave cloth 196 ins. wide at 5½ yds. per hr. This figure is based on 75% efficiency on fabrics with 15 ppi.

Circle T-13 on Reader-Service Card

Mount Hope SYSTEM

Weft Straighteners at Apponaug

save time and money
reduce seconds — increase efficiency



E. Wesley Adams, Plant Engineer, The Apponaug Company: "Operation of Mount Hope Weft Straighteners with push button control is so easy that handicapped workers, who otherwise might not be employed, become experts."

After partial drying through dry cans, this Mount Hope Unit straightens weft or filling threads before fabric enters final drying in the tentering operation.

Ask for details or have a Mount Hope Production Cost Engineer advise you.

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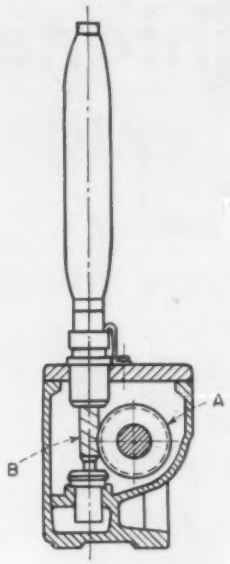


Gear-Driven Spindle

A high-speed spindle for spinning and twisting has been announced by Hispano Suiza, Geneva, Switzerland. The spindle is driven by a helical gear and worm.

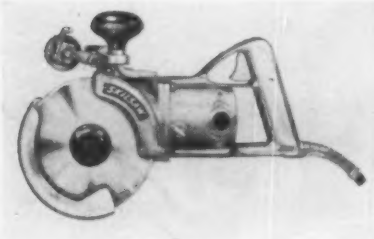
The spindles are self-centering and are protected from gear vibration and axial and radial thrust. The gear box is provided with a longitudinal shaft on which are mounted the helical gears shown at A. These gears engage the helical teeth on each spindle at B.

Oil is force-fed to all gears and bearings without splashing, and one oil filling is said to last for several years.

Yardage per bobbin can be preset by a calibrated knob. An automatic stop motion stops the spindle when the bobbin is full. Cleaner yarn is said to result from the elimination of whorls and driving belts.

The spindles are sold in the United States by Spindle Sales Corp., 385 Fifth Ave., New York, N. Y.

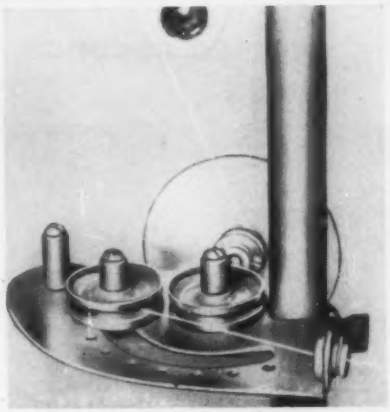
Circle T-14 on Reader-Service Card



Cotton Sampler

Skil Corp., Chicago, Ill., is now marketing an improved cotton sampler, Model 144, that is said to meet all safety requirements. Recommended for speedy sampling of baled cotton, the new device has a built-in sharpening attachment for its special knife blade. It is adaptable to special fabric or textile cutting operations. A nonsparking beryllium-copper-alloy blade reduces the possibility of fire.

Circle T-15 on Reader-Service Card

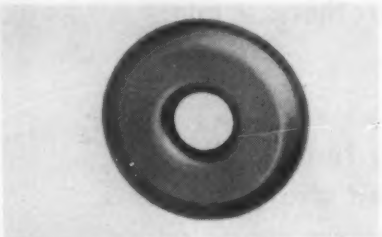


Redesigned Tension Unit

A combination three-post, two-post, and adjustable-post disk-type tension unit is a feature of the redesigned Tension-Master manufactured by Edward J. McBride Co., Inc., Philadelphia 35, Pa. The device permits a greater range of tension variation than the previous model and requires less time for adjusting.

The settings make it possible to quickly check the alignment of an entire row of units, and the tension may be decreased from the front to the rear of the creel. This feature is said to be especially advantageous for running light synthetic yarns.

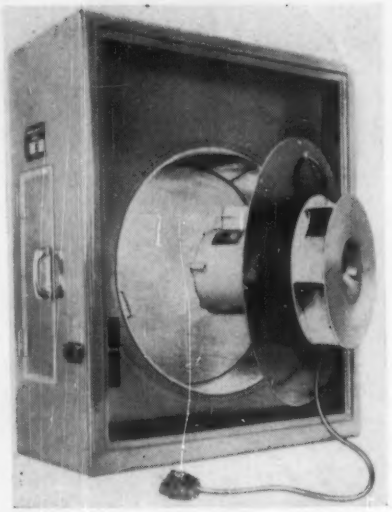
Circle T-16 on Reader-Service Card



Highly Polished Heddle

A highly polished tension washer for stainless-steel Drawtex heddles has been announced by Steel Heddle Mfg. Co., 2100 W. Allegheny Ave., Philadelphia 32, Pa. The washer is recommended for only the most sensitive yarns because it costs more than the present line of chrome-plated washers.

Circle T-17 on Reader-Service Card



Thomatex Filter Box

Thoma Co., Augstburg, Germany, has developed a Thomatex filter box suitable for many types of frames. The filter box is equipped with a 1.7-hp. motor for normal spinning frames and with a 2-hp. motor for large-gauge frames with more than 300 spindles.

The balanced fan in the filter box is coupled directly with the motor. This arrangement makes the unit sturdy, and V-belts are eliminated. Power consumption is low. The motor, located in the air current, runs cool and improves the efficiency of the fan. Air can be either blown toward the floor or toward the ceiling.

Maintenance and adjustments are easy. The front wall is attached with only two screws. When the front wall is removed, there is free access to the fan, electric wiring, and switch.

The fan, the fan support, and the motor are fixed on the intermediate wall with six screws. The entire unit can be removed after unscrewing the six screws without disconnecting the cable connections.

Stellite American Corp., 60 E. 42nd St., New York 17, N. Y., is sales agent in the United States.

Circle T-18 on Reader-Service Card

Card-Flat-Chain Lubricator

Applicable to all major makes of cards, the M&J automatic card-flat-chain lubricator lubricates through felt pads that clean and lubricate at the same time. The device is distributed by Jarrell Bullard Co., Box 2154, Charlotte, N. C.

Circle T-19 on Reader-Service Card

CONTINUED ON PAGE 208

missing the parade?

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Circle D-1 on Reader-Service Card

Softener

Nuvel . . . a neutral amphoteric material that can be added directly to scouring, dyeing, or finishing baths to give a soft, durable hand. Stable to acids, alkalis, and high temperatures. Zimmerman Associates, Box 248, Guilford College, N. C.

Circle D-2 on Reader-Service Card

Thickener

Polyco 296-W . . . for use with resin emulsions has been developed by the Polyco Dept., Chemical Div., Borden Co., 101 Foster St., Peabody, Mass. The thickener introduces no undesirable odor or color into compounded products and causes no synaresis, coagulation, or separation. The approximately neutral pH permits use with sensitive emulsions. Viscosities are unusually stable over long periods of time.

Circle D-3 on Reader-Service Card

Starch Ether

Solvitose HDF . . . a cold-water soluble product used to build up the hand of wrinkle-resistant resin finishes; works well with conventional resins. The resins insolubilize the starch ether so that the finish is durable. Morningstar, Nicol, Inc., 630 W. 41st St., New York 19, N. Y.

Circle D-4 on Reader-Service Card

Pigment Dispersions

Accosperse Dispersions . . . available in red, yellow, scarlet, blue, and green shades, are supplied in a highly flocculated disperse state resistant to alkalis. Advantages include resistance to flushing, coagulation, or settling. Pigments Div., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.

Circle D-5 on Reader-Service Card

Hydrogen Sulfide Replacement

Thioacetamide . . . can be used to replace hydrogen sulfide in analytical work. Advantages are lack of toxicity and easily filtered precipitates less contaminated with foreign ions. No generators are needed; small amounts required eliminate need for a hood. Fisher Scientific, 717 Forbes St, Pittsburgh 19, Pa.

Circle D-6 on Reader-Service Card

Floor-Paint Pigment

Pigment Green B 15-4010 . . . disperses well and has excellent resistance to alkalis and soaps. Suitable for masonry paints, printing inks, and other products requiring fastness to alkalis. Pigments Div., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.

Circle D-7 on Reader-Service Card

How To Strip and Redye Acrilan Sweaters

by

WALTER H. HINDLE, Chemstrand Corp.

For a variety of reasons, from time to time it becomes necessary to either remove dyestuff from the fiber or to effect further leveling by retransference of color, and in this respect Acrilan lends itself well to commercial requirements.

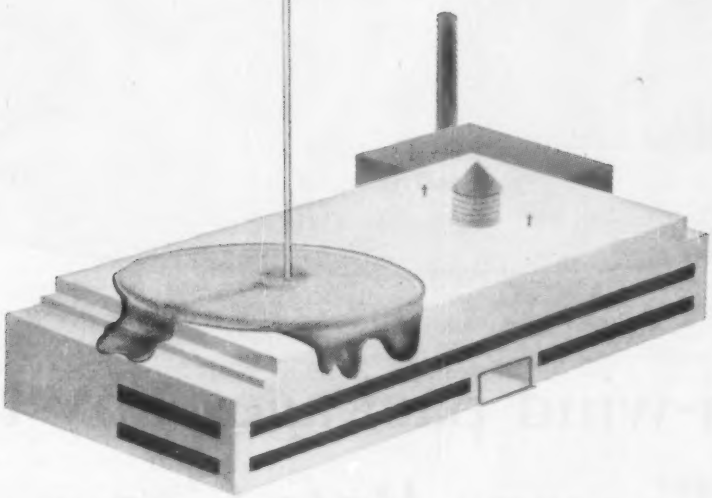
Where basic dyestuffs have been used, a treatment at the boil in 2 grams per liter Lissolamine A or V (Arnold-Hoffman) and 2 gpl. sulfuric acid will remove virtually all the coloring matter. When the goods have been dyed with acetate dyestuffs, a similar treatment using a nonionic material such as Igepal CTA to the extent of 2 gpl. in conjunction with 2 gpl. sulfuric acid at the boil will remove a very great proportion of the dyestuff evenly.

After the above treatments, the goods should be neutralized with bicarbonate, rebagged and redyed. The above stripping techniques materially accelerate the dyeing rate, and it is important to control carefully the rate of temperature increase in the opening stages of the redyeing operation to prevent too rapid a strike.

A leveling, as opposed to a stripping operation, can be effected on Acrilan dyed with dispersed acetate dyes by scouring in a nonionic detergent and 1 gpl. TSP at 200° F., which removes 30 to 40% of the color. Insofar as basic dyestuffs are concerned, it would appear quicker and more effective to go through the described stripping cycle because of the relatively low rate of transfer of basic dyestuffs.

If you use water in your process...

USE EMULSIFIABLE *A-C** *Polyethylene*



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This popular open-wind machine features versatility, high quality, and low cost production. It offers real opportunities for economy with large package spinning.

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- It winds cotton, spun synthetic staples, wool, worsted, linen and blends. Several counts can be wound simultaneously on the same machine.
- Its Rotary Traverse — an exclusive one-piece combination driving drum and traverse guide — eliminates all moving parts connected with reciprocating guides, and reduces maintenance, assures uniform packages and top quality yarn.
- Users report annual costs for repair parts averaging as low as ¼ of 1% of the original investment.

Roto-Coner Winders are quiet and trouble-free, easy to operate and to maintain. For further facts on how these machines can benefit your own open-wind package operations, write for illustrated booklet.

23.5.16

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QUESTIONS and ANSWERS

►TEXTILE WORLD'S editors are at your service to help solve your problems in yarn manufacture, weaving, knitting, dyeing, finishing, or other textile operations. If you have a technical problem bothering you, send it along to the Editor, Questions and Answers, TEXTILE WORLD, 201 E. Coffee St., Greenville, S. C.

How To Test Dacron and Wool

Technical Editor:

How can we determine the percentage of wool in Dacron-and-wool fabrics? (9923)

Dry a two-gram sample to oven-dry weight, and weigh the dried sample. Cut the sample into ¼-in. squares to help in dissolving the wool.

Treat the sample in a sodium-hypochlorite solution containing 5% available chlorine by weight. Stir the sample in the solution for 20 mins., and then filter it through a 100-mesh screen. Wash the sample with water, remove the excess water, and dry the sample in an oven at 105 to 110° C.

Weigh the sample again. To determine the percentage of Dacron, divide the final weight by the original weight and multiply by 100.

Knit Terry Cloth On Sinker-Top Machine

Technical Editor:

Can terry-type cloths be knitted on sinker-top spring-needle machines? (9929)

Terry-type cloths can be knitted on Wildman spring-needle machines in two ways. The first method requires long and short butt needles and split cams. Two feeds are required to produce one course of knitting. Here's the setup:

Feed No. 1
- Needles—Raise long butts
- Presser—Out of action
- Sinker cam—All the way in
- Needle cam—Raise to high position

Feed No. 2
- Needles—All knit
- Presser—In action
- Sinker cam—Knit normal stitch
- Needle cam—Normal position

Feed No. 3
- Needles—Raise short butts
- Presser—Out of action
- Sinker cam—All the way in
- Needle cam—Raise to high position

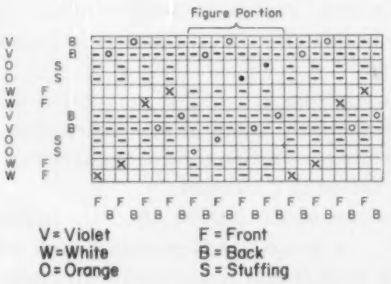
Feed No. 4—Same as No. 2

The second method requires a special sinker with two throats and a special thread guide to feed the yarn to each sinker throat. The terry yarn is fed to the upper throat. One complete course is knitted at each feed.

Use Double Cloth For Blanket Design

Technical Editor:

How can I weave a two-face woolen blanket with a small heart design in orange on a white background on the face? The back is required in a violet shade. (9909)



Here is a small design showing how such a figure could be produced by setting the design up as a double cloth. This setup allows the figure filling to run as a stuffer and appear on the face at the desired positions. The face filling will run as a stuffer while the figure is being woven.

A heavy bar effect would be produced if this design were used only at the positions where the figure is desired. If the orange filling were to run all the way through the blanket, a very heavy blanket would result.

One other solution would be to weave the blanket on a swivel loom and put the orange filling in at the desired positions.

Nonwoven Fabrics Are Made From Cellulose Fibers

Technical Editor:

What are nonwoven fabrics, and what fibers are they made from? (9915)

Nonwoven fabrics are made from cotton or rayon staple. The cotton may be garnetted thread waste, and the rayon may be dull or bright.

The fabrics are made by spraying a synthetic plastic over the individual fibers as they lay in a web form. The material moves along a lattice and passes through heated rolls to bind the fibers together. The web may be card web, or it may be made with special machinery.

Bonding agents are starch, cellulose, polyvinyl acetate, polyvinyl chloride, polyvinyl alcohol, formaldehyde insolubizing-type resin, and synthetic or natural-rubber latex.

The fabrics are made in many different weights and thicknesses; and they are used for ribbons, tapes, bags, wiping cloths, napkins, window cleaners, and surgical masks.

Calcium-Alginate Yarns Are Readily Dissolved

Technical Editor:

What are alginate yarns, and what are they used for? (9942)

The raw material for alginate yarn is obtained from seaweed. One of the unique properties of this fiber is that it is readily dissolved in a modified soap scour.

The yarn can be used as a scaffold thread to produce very fine fabrics where the yarn would not normally stand up to the rigors of weaving. The alginate yarn is twisted with wool, cashmere, or other yarn and woven in this condition. During the finishing operation, the alginate yarn is dissolved and washed away.

Another use in woven fabrics is for open-work structures, where alginate yarn can be woven in some pattern. When the alginate yarn is scoured out, the fabric made of cotton, wool, or a synthetic still remains. [See TW, June, '55, p. 98 for a use in knitted fab-

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BUCKEYE ...first in cellulose

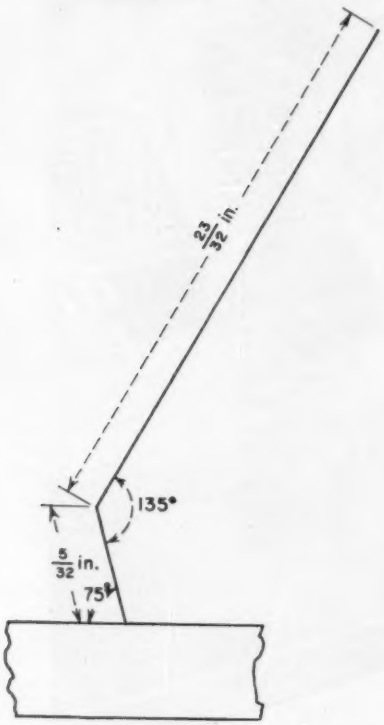
June, '55, p. 98 for a use in knitted fabrics.]

Fabrics are treated with soda ash and common salt or Calgon and salt at 120° F. to remove the alginate.

Fancy-Roll Wire For Nylon Carding

Technical Editor:

What type of wire was used on the fancy roll that helped get double nylon carding production at Rex Mills? [TW, May, '55, p. 112] How was power applied to the fancy? (9922)



The wire on the fancy is a knee wire measuring $\frac{5}{32}$ in. from the base fabric to the knee and 23/32 in. from the knee to the point of the wire. It is cadmium-plated for smoothness.

The diameter of the fancy roll, including the wire, is 7 ins. The wire has 70 points per square inch. The width of the fillet is $\frac{1}{4}$ in.

The fancy roll is fastened to the front of the card at the stripping door and is driven directly from the cylinder pulley by a crossed belt.

Lint-Free Creels Pose a Problem

Technical Editor:

How are mills that have switched to lint-free creels storing roving now that spare roving can no longer lie on the creel? (9924)

Lint-free creels do pose the problem of storing spare roving.

One mill was lucky enough to have a spare area near the center of the spinning room to store truckloads of roving. The roving is delivered in trucks from the roving section by one man and stored in the area until required by the spinner, who helps herself from the trucks when she needs roving.

Other mills have the roving trucks pushed to scattered parts of the spinning room, and the spinner helps herself from the trucks.

In spite of the extra walking that the spinner might do, the new creels have increased work assignments by as much as 30% because of the reduced cleaning time. The roving is handled less and kept cleaner.

Use Two Size Formulas For Terry Towels

Technical Editor:

What formula should be used to slash Turkish towels? (9925)

For the best results, use one formula for the terry yarns and one for the ground beam.

The formula for the terry yarns is much lighter than the formula for the ground beams. Use 21 lbs. No. 87 starch, 1½ lbs. softener, and 3 oz. Demsta to 100 gals. of water.

For the ground beam, use 78 lbs. No. 87 starch; 4 lbs. No. 40 softener, and 6 oz. Demsta to 100 gals. of water.

TEXTILE TICKLES . . . . . *By Edgar Allen, Jr.*

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KINKS AND SHORT CUTS

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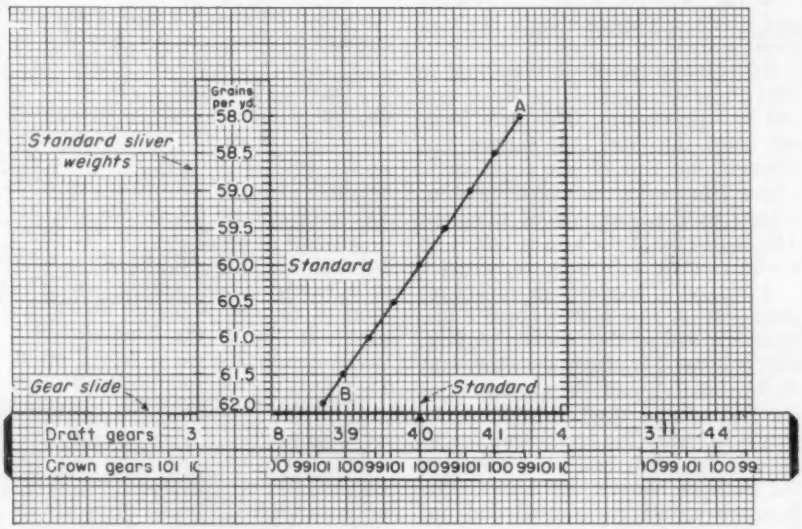


How To Make and Use a Change-Gear Calculator

Many supervisors spend too much time tediously calculating draft-gear changes on drawing frames. A handy calculator can be made in four easy steps:

1. List the standard sliver weights in the left vertical column of a piece of heavy 10x10 graph paper.

2. Devise a sliding base line, as illustrated, and mark draft- and crown-gear teeth on it. Place the figures representing draft-gear teeth 10 spaces apart, and let each space stand for one-tenth of a tooth. Crown-gear teeth are shown in proper ratio to draft-gear teeth on the slide. One tooth on the crown gear is equal to approximately 1% of sliver weight.

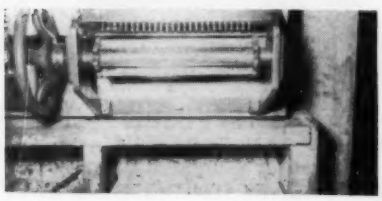
3. Calculate the values of each full and half grain of sliver in accordance with the formula:

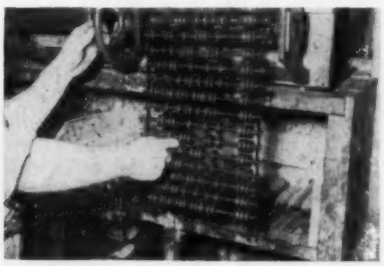
$$\frac{\text{Standard sliver weight} \times \text{draft gear on frame}}{\text{Actual sliver weight}} = \text{draft gear required}$$

4. Place dots for each value on the chart above the proper gear readings. Connect the dots with a straight line from *A* to *B*; this line crosses all intermediate decimal-grain values.

To use the chart, read horizontally from any grain value in the left-hand column to the point where it intersects line *AB*. A vertical reading from the intersection to the gear slide below indicates the required gear.

When a gear change lies between two draft-gear numbers, use the number nearest the position indicated on the gear slide. Then make crown-gear changes for closer control of sliver weights. (K-2762)





Jig Aligns Chains for Knowles Heads

To prevent harness skips in the cloth woven on looms with Knowles head motions, the pattern chains must be checked and rings must be put in to align the risers. This practice is especially important when old chain stock is used.

Ordinarily, the chains are checked after they are put on the loom, but this method is not accurate. And, in addition, loom production is lost while the loomfixer is checking the chain.

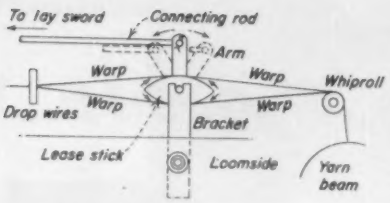
We have built a jig to line up pattern chains before they are put on the loom. The jig is a frame assembly similar to the front and back head frame on a head motion. A chain cylinder and handwheel are fitted to the frame. A bar with spring plungers is set over the chain cylinder, and the plungers are spaced for a perfect pattern chain.

After our man who builds chains completes a chain, he puts the chain on the jig to test each bar of the chain. If any of the risers do not line up perfectly with the spring plungers, the chain builder uses rings of different diameters to align the bars.

The rings and a special tool to insert them are bought from a loom-supply company.

Now, our pattern chains are always in good condition when loomfixers put them on the looms. Weave-room efficiency is increased, and many harness skips are eliminated. (K-2696)

Eugene P. Schremp, Bristol, R. I.

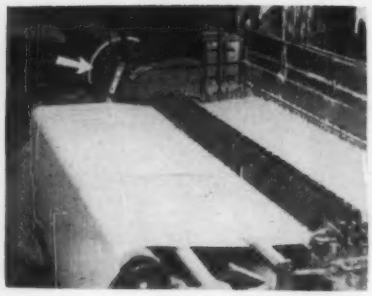


Wiggler in Warp Stops Draw-Backs

Sometimes a warp requires a lease bar or lease stick behind the drop wires. The lease rod is needed because (1) warp ends are crowded, (2) a warp has excessive sizing material, (3) warp ends are crossed, or (4) slack and tight ends are made by the excessive beat-up of certain weaves.

No one likes to run warps that require such a crutch, but sometimes a lease rod has to be used. Since a stationary lease stick does nothing but divide the warp ends, it often causes more draw-backs than it prevents. Therefore, the lease stick must be given some sort of movement. Usually, moving lease sticks are put on the loom in a makeshift fashion.

At our mill, we're weaving drapery fabrics from heavy warp sets that require moving lease sticks for best weaving results. Consequently, we've made a device to move the lease stick that is neat in appearance, works without attention, and is easily moved from loom to loom where it is needed.



A ⅜-in. steel pin is driven into each end of an oval-shaped lease stick to form journals.

A 7/16x1x6-in. piece of strap iron is bent to a 90° angle 2 ins. from one end to form an arm. Two ¼-in. holes are bored into the 2-in. surface and through one end of the lease stick. Three ⅜-in. holes are bored on 1-in. centers in the long end of the arm. The short end of the arm is bolted to the lease stick with ¼-in. capscrews.

A bracket is made from 7/16x1x6-in. strap iron. A ⅜-in. hole is bored 2 ins. from one end of the bracket. A ⅜-in. hole is bored ¾ in. from the other end of the bracket, and the surface from the end of the bracket to the ⅜-in. hole ¾ in. from the end is cut out to make a slot. This bracket is bolted to the loomside about 6 ins. back of the drop wires with the slotted end up. An identical bracket is bolted to the opposite loomside.

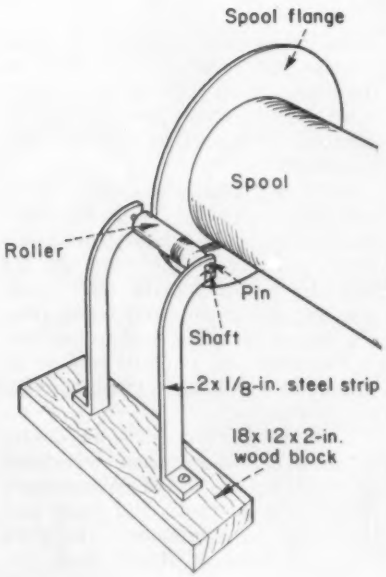
Then the lease stick is inserted through the leased warp, and the journals are placed in the slots in the brackets. The brackets are adjusted up and down so that the lease stick rests in the warp yarn without any strain on the yarn. The arm of the lease stick is put on the battery end of the loom.

A ⅜-in. steel rod is used as a connecting rod to move the lease stick. One end of the rod is bent to a 90° angle ½ in. from the end. A ⅛-in. hole is bored in the ½-in. end for a cotter pin. The other end of the rod is rolled to a ½-in. circle and is bent to a 90° angle where the circle is formed.

The over-all length of the connecting rod is determined by measuring from the slot in the upright bracket to the back of the lay sword at the handrail when the harnesses are level. The back end of the connecting rod is fastened through one of the three holes in the arm on the lease stick with a washer and cotter pin. The front of the rod is bolted under the wing nut bolt at the handrail.

The connecting rod is moved up or down in the three holes in the bracket to give the lease rod more or less movement, as needed.

The completed device causes the lease rod to rock back and forth as the lay moves. This warp wiggler breaks up draw-backs before they have time to damage the cloth. (K-2702) *Wilmer C. Westbrook, Trion, Ga.*



Remove Tricot Ends With This Gadget

When we remove excess ends from the edges of our tricot spools, we use a device made in the mill to take the ends off while the machine is running.

The device is made from two pieces of 2x⅛-in. steel strip, a 2-in.-dia. wooden roller, and an 18x12x2-in. wooden block. The steel strips have a ½-in. hole drilled near the top.

The tops are bent forward and the bottoms are bent to form brackets, which are drilled and screwed to the wooden block. The roller is drilled through the center; a ½-in. rod forms a shaft on which the roller rotates; two cotter pins keep the rod in position.

When ends need removing, the block is moved to the back of the tricot machine and the wooden roller is placed against the spool flange. The loose end is wrapped around the roller, and the flange turns the roller and winds the yarn on the roller. (K-2770)

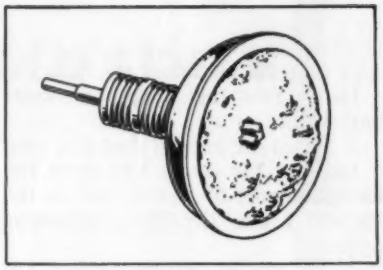
Two-Piece Treads Make Durable Outdoor Steps

When an outdoor staircase is built with one-piece treads, the treads are affected by rain and begin to warp. Then the treads crack, and the whole staircase has to be replaced. This deterioration can be prevented.

Instead of using a single piece for the tread, use two pieces of wood. The crack lets water run through and keeps the two pieces dry. Also, the split tread will warp less than a wider tread.

Locust wood is excellent for the supporting parts that enter the ground. This wood, highly rot-resistant, can be chopped and cut without difficulty while it is green; the wood becomes as hard as iron after it has dried.

A new stairway we built this way about five years ago is still in perfect condition. (K-2755) *W. F. Schaphorst, Newark, N. J.*



Star-Drill Guard Prevents Flying Chips

Here's a star-drill guard designed to eliminate flying dirt or chips. It consists of a suction cup made from a plunger and two cellulose sponges. The suction cup, which holds the sponges, is fastened to the bit with a spring collar and setscrew. The springs are in sections and can be adjusted to fit any length of bit. Dampened sponges will help prevent fires and keep down dust. (K-2783) *Gadgets*

Best-Kink Award for October

Each month TEXTILE WORLD awards $25 to the submitter of the Kink judged by a panel of over 200 practical mill men as the best for that particular month. A new batch of Kinks appears each month, and a new group of readers acts as judges each month.

If you are asked to judge one of these days, be sure to help select the best Kink by sending back your answer in time for final tabulation. Closing date for judging is the last day of the month in which the Kink appears.

The best Kink for October, according to TEXTILE WORLD reader-judges, was:

"Separator Plates Improve Winding"

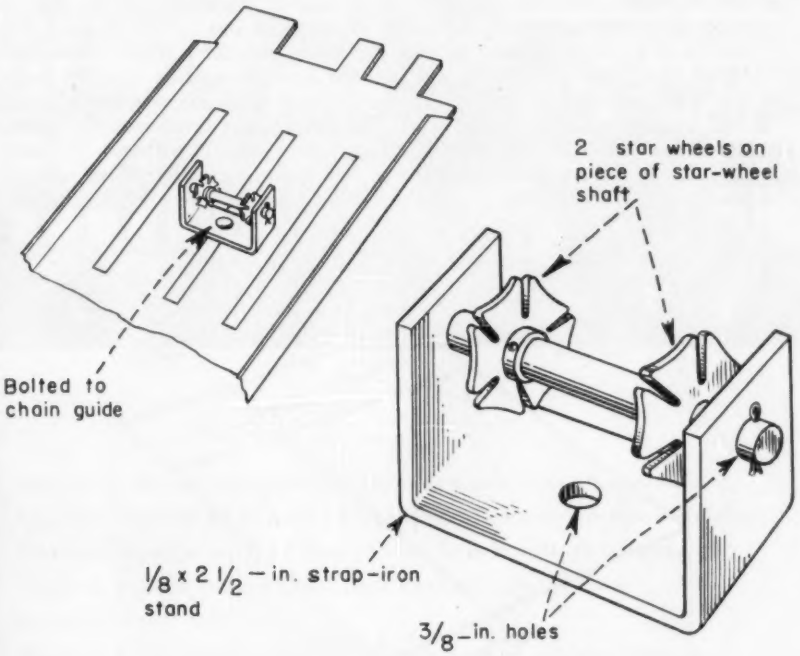
By G. A. Schick, Vancouver, B. C.

Mr. Schick is being sent a check for $25 with the compliments of TEXTILE WORLD.

Hook Used To Lift Cloth-Roll Rods

Each time a roll of cloth goes through the shearer, the operator must remove the iron rod on which the roll of cloth revolves in the cradle before he puts on another roll. These rods are heavy and can strain the operator.

Ralph M. Hawkins, shearer operator, made a lifting device from a metal rod with a hook on one end. Now, instead of stooping to lift the heavy cloth-roll rod, he simply hooks it with his lifting rod and lifts it to the height of his hands. The possibility of a strained back is eliminated. (K-2791) *Joanna Way*



We Stopped Balks in Our Box Patterns

Our 92-in. W-3 looms are equipped with three-chain overhead multipliers. The chains used to hang up and cause pattern balks.

To overcome chain hanging, we cut a slot in the chain guide for each of the three chains and placed a chain-separator stand over each of the slots. The separator stand holds the chains apart and prevents hanging.

The slots are cut $\frac{3}{8}$ in. wide and 8 ins. long in our machine shop. Before the chain guide is taken from the multiplier, the guide is marked with a center punch at the center of each chain. The slots must be cut exactly parallel to the line of chain movement.

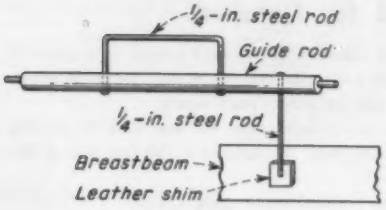
The separator stand is made from strips of strap iron $1\frac{1}{2}$ ins. wide by $\frac{1}{8}$ in. thick. The iron, bent to three-quarters of a rectangle, has one $\frac{3}{8}$-in. hole for a bolt to fasten the stand to the guide and two $\frac{3}{8}$-in. holes for the star-wheel rolls in the stand.

The separator star wheels are taken from discarded shafts.

The 8-in. slots permit adjustments for various length chains.

Since we put chain separators on the chain guides, we have had no more box-chain balks. (K-2785) *Guy E. Stephenson, Columbiaville, Mich.*

number



Guide-Rod Extension Controls Broken Picks

Good loomfixing eliminates most broken picks and center loops in cloth woven on looms with center-fork filling stop motions. But a loom can be in perfect mechanical condition and the defects will still be made on fine-denier filament-synthetic yarns.

Broken picks are a major defect and cannot be repaired. Center loops can be repaired, but the repairs add to the cost of producing the fabrics.

When broken picks are made, we first check our looms and shuttles to be sure they're in good mechanical condition. Then, if the broken picks are still made, we add a little device that eliminates most broken picks.

The device is a small rectangular extension to the cloth guide rod near the fell of the cloth. The device is made by bending a piece of ¼-in. steel rod. One side of the rod is bent 3 ins. long with two extensions bent 2 ins. long at right angles to the 3-in. side.

Two ¼-in. holes are bored near the center of the guide rod so that the ends of the bent rod fit tightly in the holes. The ends of the rod are peened to lock the rod into the guide rod.

Another ¼-in. hole is bored near the end of the guide rod, and a 4-in. length of the ¼-in. steel rod is peened into the hole in the guide rod.

The guide rod is placed back on the loom, and the auxiliary extension in the center is used to force the warp shed up or down at the center fork. The extension at the end of the guide rod rests on the breastbeam and acts as an adjusting rod. The rod is shimmed up or down at the breastbeam to adjust it. The guide rod is set 1 in. from the fell of the cloth.

Here's how the guide rod affects broken picks:

1. When the bottom shed of a warp is too low, the center fork drags the filling into the filling-fork well in the lay and breaks the filling or makes loops.

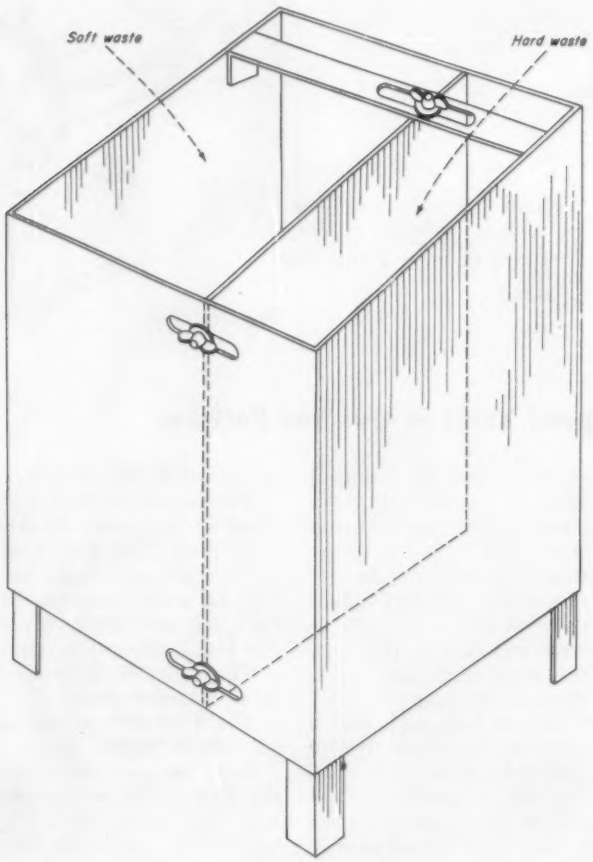
2. When the bottom shed is too high, the fork makes false stops.

3. It's not practical to readjust all the harnesses each time they affect the center fork. The height of the harnesses varies with the warp tension and sometimes varies with humidity changes, especially on jacquards.

4. Now that we have the extension on the guide rods, we can adjust the warp shed accurately at the center without disturbing the over-all harness settings.

When temples are used, we also use a guide rod.

Now we've eliminated broken picks, center loops in the filling, and false filling-fork stops. (K-2568) *Charles S. Bicksler, Lancaster, Pa.*



Partition in Hopper Helps Blend Waste

Tests made in our mill indicated that hard reworkable waste, such as spinner balls and roving waste, loses about ⅛ in. of staple length when it is put through the waste machine. Soft waste, such as lap, card-sliver, comber-lap, comber-sliver, and drawing-sliver waste, does not deteriorate greatly when reworked.

Blending the two kinds of waste, however, presented something of a problem because we frequently got too much hard waste in the mix and bad-running work resulted.

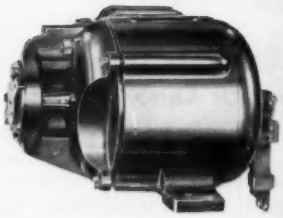
We solved the problem by building an adjustable partition in the waste hopper feeder, as shown in the sketch. The larger compartment is used for soft waste; the smaller compartment is used for hard waste.

The partition is adjusted by trial-and-error until the proper proportions of the two kinds of waste are obtained. Better-running work and improved yarn quality result when a uniform blend is fed into the cotton. (K-2809) *J. R. Wickle, Sr., Charlotte, N. C.*

MOTORS

number seven of a series depicting

MORE AND BETTER TEXTILE PRODUCTION WITH HYATTS



(Above.) Diehl Power Transmitter Loom Motor with two Hyatt Roller Bearings to facilitate lateral movement of drive shaft when clutch is engaged or disengaged.

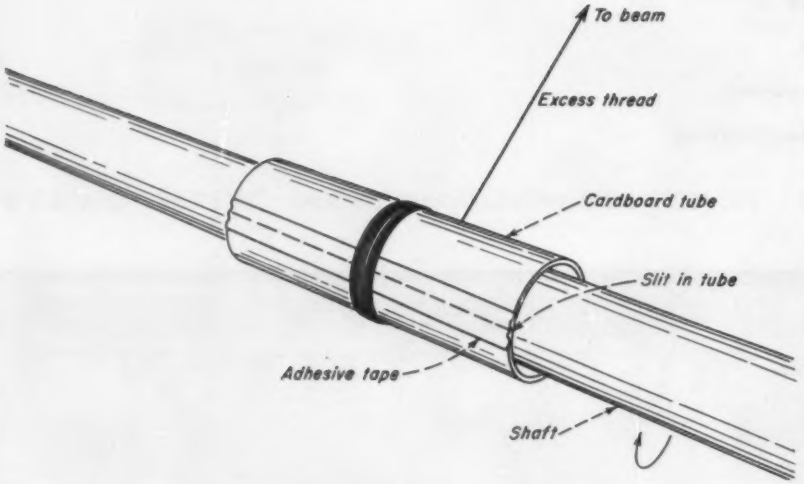
(Above, right.) A typical group of Diehl "DIT" Lint-free Motors, with Hyatts at the shaft extensions, operating spinning frames at the Greenwood Mills, Greenwood, S. C.

Supplying power to textile machinery is a punishing job, often involving long hours of uninterrupted service under adverse conditions. *Gear tooth pressure*, as in loom drives, or *belt pull*, as in spinning frame or twister frame drives, puts unusually heavy loads on motor shaft extensions.

That's why leading makers of textile motors standardize on rugged Hyatt Roller Bearings on the shaft extension end, where radial loads are too heavy for ball bearings. Hyatts assure long life, dependability and freedom from costly down-time—more reasons why you're always sure of *more and better textile production with Hyatts!* For further details on the profitable application of Hyatt Roller Bearings to textile machinery, request Bulletin T-54 from Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER



How To Remove Threads From Raschel Beams

We sometimes get one or two threads on our raschel machines that are superfluous for the fabric being run. These threads must be drawn off separately.

Here's how to do it:

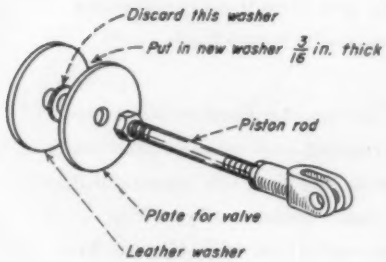
Cut a piece of cardboard cloth-shipping tubing into 6-in. lengths. Slit the cut length down one side with a sharp knife.

Slip the tube over one of the fast rotating shafts that run across the front of the machine, and position it opposite the thread or threads that need to be removed.

Rejoin the slit part with adhesive tape.

The tube rotates with the shaft, but slight pressure will slow it down. Take the excess thread from the beam and slip it around the rotating tube; the thread will be taken off the beam at the same rate of speed as the yarns being knitted.

When the tube becomes too heavy for the shaft to turn, the threads are cut off with a sharp knife. The same idea can be used on old-type tricot machines that have fast-running shafts. (K-2797)



Do Your Pumps Go "Woof-Woof"?

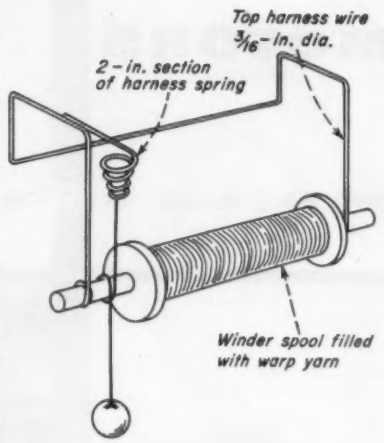
To eliminate the vacuum noise or "woof-woof" made by the vacuum cylinders on our C&K S-5 and S-6 looms, we rearranged the piston-rod parts inside the cylinder.

First we remove the metal washer from between the leather washer and the plate for the valve. Then we make a thicker washer to take the place of the discarded one. The new washer is made from a bar in the frame of an electric warp stop motion.

To make the washers several at a time, we bore $\frac{3}{8}$-in. holes at intervals along the length of a bar. We saw the bar in two between the holes and bolt the resulting blocks together on a long $\frac{3}{8}$-in. bolt with the head cut off. The bolt is chucked in a lathe, and the blocks are turned down until a $\frac{7}{16}$-in. surface is left around the holes.

The hole in the leather washer is enlarged so that the newly made washer will just slide through the leather washer. The piston rod parts are reassembled.

With this setup, the leather washer moves back and forth. The "woof-woof" noise is eliminated, and we still have a good vacuum. (K-2741) *Charles R. Batzer, Lancaster, Pa.*



Spring Controls Tension On Yarn for Leno Doupe

When we weave a fabric double-width in the loom, we weave false selvages in the center of the warp. Then when the cloth is slit down the center, the selvages will not unravel. The false selvage is similar to a leno weave, and a leno doupe is used.

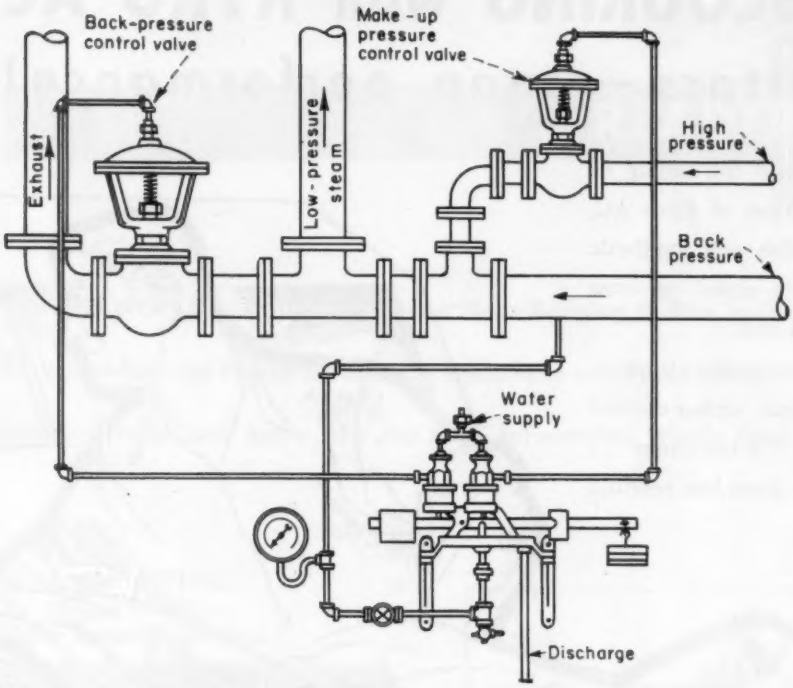
The doupe warp end does not come from the regular warp but is placed on a spool, which is usually mounted to the back arch of the loom. The tension on the spool must have a reciprocal motion because of the difference in the tension of the two weaves; one weave is plain leno and the other is a doupe weave.

We make the mounting bracket for the spool from old top harness wire and use a short section of harness pull-down spring for the reciprocal action. The bracket is made by bending the harness wire, as shown in the sketch. The action of the end pulling against the bracket locks the bracket to the loom arch, but the bracket is easily lifted off.

The piece of harness spring is secured to the bracket with 2 ins. of spring protruding. A twine-over-steel-cable harness cord is hooked to the harness spring.

A winder spool filled with warp yarn is mounted tight on a winder spindle and fastened to the bracket. The harness cord is wrapped one complete turn around the spindle head, and a small weight is hung on the free end.

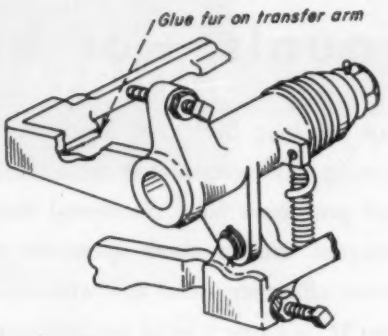
With this setup, the spring flexes enough to let the yarn weave with the leno doupe. Then when the doupe returns to its inactive position, the spring draws the warp end taut again. (K-2630) *Charles S. Bicksler, Lancaster, Pa.*



Exhaust-Steam Piping Provides Low-Cost Heat

Here is a piping arrangement that makes it possible to use 100% of your exhaust steam for heating or processing. The setup monitors the exhaust steam and saves live steam with much more precision than is possible with hand control. The arrangement further permits the use of much of the existing piping and valves, which precludes the necessity for installing entirely new equipment.

If there is a surplus of exhaust steam, the regulator automatically switches it into the atmosphere. If the exhaust steam is insufficient, the control device admits live steam into the exhaust. As soon as the necessary heat has been supplied, the live steam is automatically cut off. (K-2779) *W. F. Schaphorst, Newark, N. J.*



We Use Shuttle Fur To Stop Cut Filling on the Transfer

The transfer hammer on C-5 looms will often cut the filaments on filling that is used for decorative checks. The filament-rayon filling is usually run in one shuttle and staple-rayon filling is run in the others.

To stop the cut filaments, we glue a small piece of shuttle fur to the bottom side of the transfer hammer at the point that strikes the filling on the transfer. The hair of the fur is trimmed short.

The small cost of the fur and the time required to place the fur on the transfer hammer is offset by less filling waste, better cloth, and increased loom production. (K-2808) *Bernard Dixon, Danville, Va.*

$500 for Best Kink in 1956

$25 for Best Kink Each Month

In Addition to Space Payment on Acceptance

Send in your Kink now. There is always a contest going on.

We will polish up your writing and will have an artist make finished drawings. But send in plenty of details so that your Kink can be clearly explained. Be sure your sketch is clear and well labeled, but it need not be a polished job. Best of all, send us a good glossy photograph of it; we will pay you extra if you do and we can use it.

We like ideas for improving machines, new devices that a mill man can build, attachments or methods of merit—anything that will cut costs, improve quality, or help production.

RULES OF CONTEST

1. No limit to number of entries.
2. New $25 prize contest every month, $500 prize contest for the year. Monthly contest confined to Kinks published that month, yearly to those published in calendar year 1956.
3. All Kinks paid for on acceptance; extra payment for photographs. Drawings need not be finished (clear detailed pencil sketches will do).
4. Previously published material not eligible for prizes.
5. Unless you advise to contrary, we assume we may sign your name to Kink when published.
6. Prize winners will be selected by readers, a different group each time. At least 200 will be asked to select preferred Kinks in each issue. Their votes will select the best Kink, and their decision will be final. In cases of ties, duplicate prizes will be awarded.

Send Kinks to:
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FULLING and SCOURING with KYRO AC

equals — or betters — soap performance!

Soap has long been the "accepted" agent for fulling or scouring wool goods. But with the advent of Kyro AC, wool processors have discovered that this new synthetic detergent handles these operations with equal, or even greater efficiency – and at lower overall cost.

Kyro AC is a new type of modified amine condensate product with soap-like action on wool. A clear, amber-colored liquid, Kyro AC is a versatile detergent . . . a fast rinser . . . a field-tested product which consistently gives low residual oil contents with all types of wool oils.

efficient in many operations!

Kyro AC does an unusually efficient job

- *in straight fulling and scouring* affords substantial savings in washer time and hot water.
- *in "acid fulling"* and scouring wool fabrics carbonized in the grease. Produces a soap-type finish.
- *in batch or dolly scouring* of fabrics which are not fulled.
- *in "neutral" fulling* and scouring of color sensitive stock-dyed fancy woolens.
- *in wool yarn scouring.*

Note: For best scouring results, the addition of alkaline builders such as soda ash, modified soda, sodium bicarbonate, and complex phosphates are recommended.

Kyro AC has consistently proved superior in cutting fulling time, eliminating wrinkles, minimizing stretch-out in the washer and dye kettle, producing fabrics of noticeably better body and cover.

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EQUIPMENT AND SUPPLY NEWS:

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TEXTILE WORLD, A McGraw-Hill Publication, New York 36, N. Y. December, 1955

NEW LITERATURE Continued

Outstanding NEW LITERATURE
Free for the Asking

NO REPEATS . . . Listed here for December are current bulletins reviewed by the editors of TEXTILE WORLD. To get the ones you need, circle the number on the Reader-Service card, as described on the preceding page.

AUXILIARY EQUIPMENT

Alloy bobbins—Aluminum-alloy bobbins, beam flanges, beams, other textile specialties. High Duty Alloys Ltd. (F-1)

Prelubricated bearings—For electric motors. Automatic metering of lubricant. Bulletin A-2406. Reliance Electric & Engineering Co. (F-2)

Tension device—For redrawing nylon yarns. Automatic maintenance of even tension. Heany Industrial Ceramic Corp. (F-3)

Adjustable-speed drives—Electronically controlled, preassembled units up to 200 hp., speed ranges 16 to 1. Elliot Co. (F-4)

High-speed couplings—For compressors, other heavy-duty drives. Dynamically balanced. Bulletin 52. John Waldron Corp. (F-5)

Enclosed motors—For service where explosionproof motors are necessary. One to 10 hp. Bulletin 1879. U. S. Electrical Motors, Inc. (F-6)

Loom harness—Improved models in wood or metal frames. Special heddles. Units developed for high-speed warping. Steel Heddle Mfg. Co. (F-7)

Recording spectrophotometer — For flame photometry, color analysis. Bulletin 405. Beckman Div., Beckman Instruments, Inc. (F-8)

Power exhaust fans—For roof installation. Louvers direct gases away from roof. To 14,000 cu. ft. per min. Bulletin S-3. Proctor & Schwartz, Inc. (F-9)

Card coilers—For increased production on cards. 15x42 ins. Fewer doffs up production. Southeastern Loom & Machine Works, Div. of Abney Mills, (F-10)

Speed changers—From 1 to 75 hp. Vertical or horizontal mounting. Bulletin 20B6013D. Allis-Chalmers Mfg. Co. (F-11)

Variable-speed transmissions — Belt-driven, infinitely variable drives for many purposes. Bulletin 188. Sterling Electric Motors, Inc. (F-12)

Magnetic pulleys—For separating ferrous trash from conveyors. For 12- to 60-in. belts. Bulletin 303C. Stearns Magnetic, Inc. (F-13)

Motor controls—For pumps, compressors, air-conditioning motors. Starters, pressure switches, vacuum switches. Bulletin EC-80. Cutler-Hammer, Inc. (F-14)

V-belts—For prime movers, auxiliary drives. Single and multiple types, solid and link construction. Mauray Mfg. Corp. (F-15)

Textile testing instruments—Lap-and-yarn-uniformity testers. Brush Electronics Co. (F-16)

Fluid drive—Dry-type fluid drives for textile machines. Load moved by wedging steel shot between stator and rotor. Bulletin A-640. Dodge Mfg. Corp. (F-17)

Speed reducer—Worm-gear types for most power-transmission purposes up to 300 hp. Cleveland Worm & Gear Co. (F-18)

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McGraw-Hill Publishing Co., Inc.

NEW LITERATURE Continued

Humidifiers — Steam-operated, automatically controlled units for industrial humidification. Bulletin 500. Armstrong Machine Works. (F-19)

Infrared spectrophotometer — for research, quantitative analysis. Bulletin 410. Beckman Div., Beckman Instruments. (F-20)

SUPPLIES & CHEMICALS

Brine handling—Methods and equipment for modern brine systems described in 32-page booklet. International Salt Co. (F-21)

Fatty acids—From various sources for soaps, softeners, cosmetics, lubricants. Archer-Daniels-Midland Co. (F-22)

Resin copolymer—For preventing development of odors in resin finishes. Textile Adjuncts Corp. (F-23)

High-gloss softener—For developing glossy finishes on resinated and embossed fabrics. Textile Adjuncts Corp. (F-24)

Industrial greases—Lithium-soap compounds for multipurpose lubrication. Simplify maintenance schedules. Sinclair Refining Co. (F-25)

Oleic acids—Complete catalog of oleic acids, including end-use charts, analytical data. Emery Industries, Inc. (F-26)

Acrylic esters—For formulating textile finishes. Bulletin F-7434. Carbide & Carbon Chemicals Co. (F-27)

Pilot plant—15-gal. unit for reaction or distillation processes. Up to 150 lbs. per sq. in. pressures. Patterson-Kelley Co., Inc. (F-28)

Textile spools—Corrugated or slotted, flexible heads. For jack frames. Thomas Leyland Machinery Co., Inc. (F-29)

Aluminum bobbins — One-piece construction for synthetic yarns. Resist heavy pressures. Allentown Bobbin Works, Inc. (F-30)

ENGINEERING & MAINTENANCE

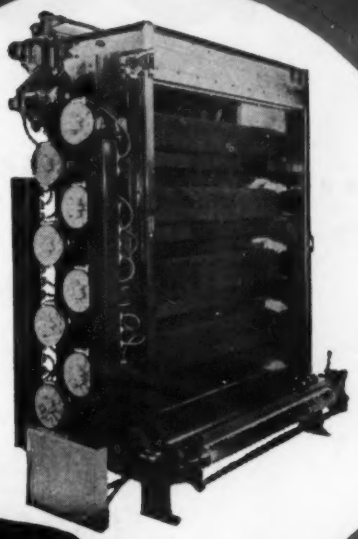
Oil burner—For commercial and industrial heating. 17½ gals. per hr. capacity. Burns heavy oils. Bulletin AD-131. Cleaver-Brooks Co. (F-31)

Combustion equipment—Oil and gas burners, auxiliary equipment for industrial use. Bulletin OB-53. The Engineer Co. (F-32)

Hot-water tanks—Storage tanks in several materials adapted to many types of installation. Cat. 18. Patterson-Kelley Co., Inc. (F-33)

CONTINUED ON PAGE 188

METLKOR® BRUSHES PREFERRED



NEW HERMAS MOTORIZED BRUSH

"Most of our customers prefer METLKOR BRUSHES," states the Hermas Machine Co., well-known manufacturer of clothroom equipment, "because:

"—The cores never warp or get out of alignment . . .

"—Bristles don't fall out . . .

"—Rolls are balanced to prevent whipping.

"—All of which is conductive to long brush life and even brushing."

Hermas uses METLKORS in this new motorized brushing machine, as they have in other Hermas brushes, because of their superior performance.

The metal cores, of aluminum, cold drawn steel, stainless steel, copper, or bronze, cannot sag, split, or get out of alignment.

Bristle is wound on the cores by our patented refillable process, firmly held with flat metal wire, and sealed with special baked plastic cement.

® Reg. U. S. Pat. Off.

M. W. JENKINS' SONS, INC.

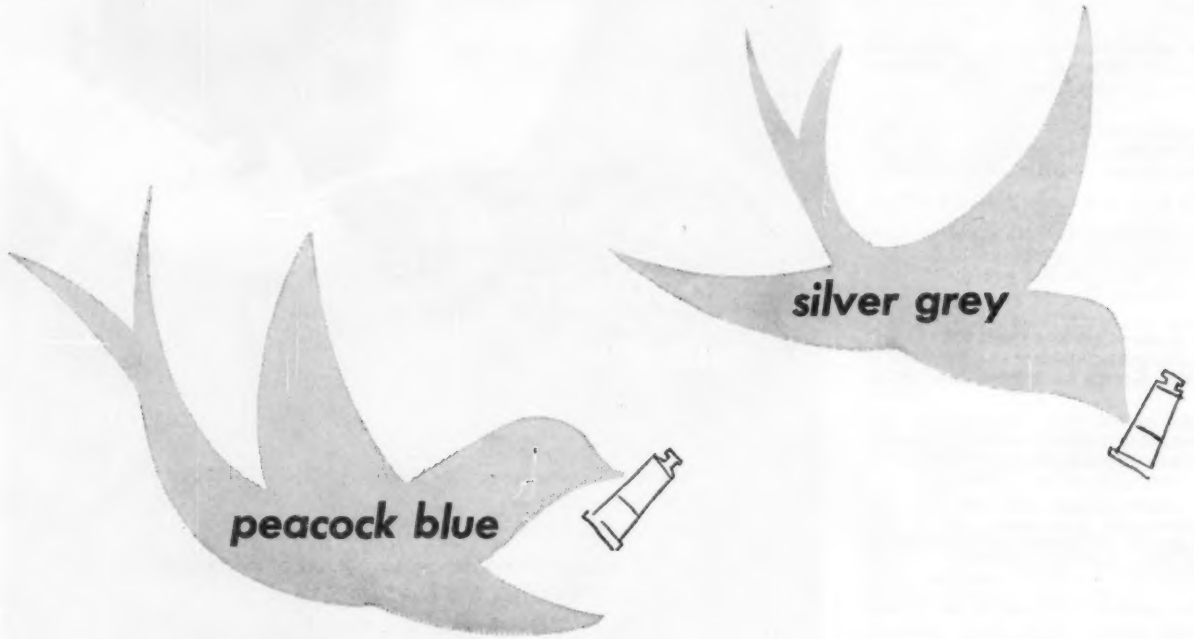
Over Three-Quarters Century of Pioneering Brushes for Industry.

Cedar Grove, Essex County, New Jersey

TELEPHONE Verona 8-5327

color

...as 5 new, easy-blending colors appear in superfast Coloray



The arrival of these five glorious colors brings the basic range in Coloray to 19 colors! And skyrockets the number of possible new color effects up and up and up—way over the more-than-2,000 colors already created.

For Coloray colors are not only phenomenally *colorfast*, but remarkably *blendable*. What *new* categories of color can now be blended? A brilliant range of blues . . . clean-cut, clear as jewels. A gamut of greys that are true solids. A rich range of dark greens. A larger, *livelier* family of tans-rusts-browns. And all these colors can be mixed as readily as paints on an artist's palette.

All Coloray colors—basic or blended—enjoy spectacular ratings for fastness of every kind. Sunfastness. Wash-fastness. Fastness to perspiration, cleaning, air fumes. The reason is—the color is caged deep in the fiber, not superficially applied. That's why Coloray color is also richer, glowier, *lovelier* than ordinary color.

And that's why textile people, manufacturers, retailers who do business with color . . . do *better* with Coloray!

For further information, write:

COURTAULDS (ALABAMA) INC., *first name in man-made fibers, first name in solution-dyeing*
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COLORAY.

Courtaulds' rayon fiber with Captive Color..."*can't escape!*"

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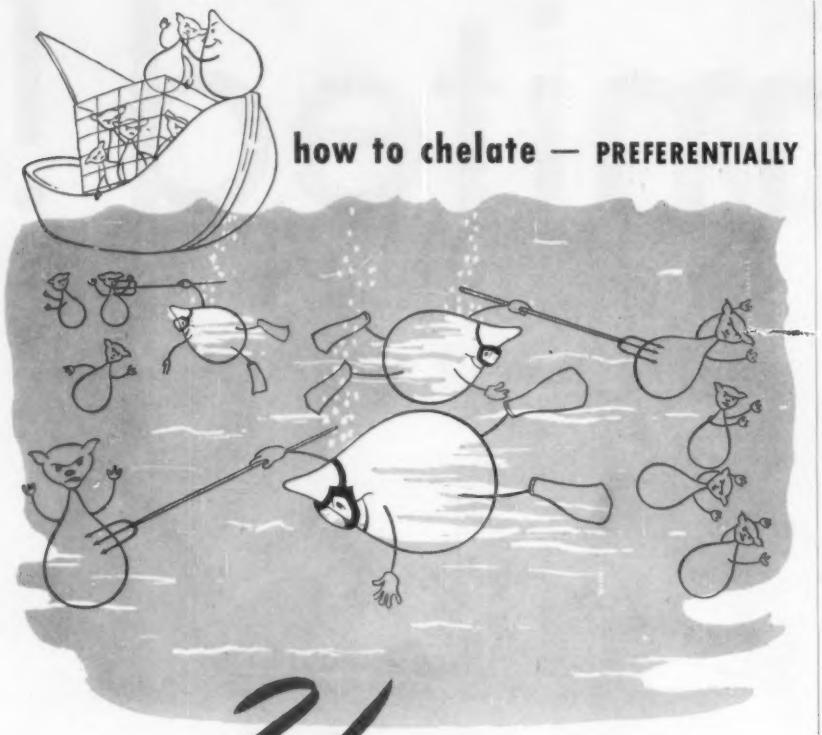

... Versene®

CATION CONTAMINATION

Excesses or deficiencies of the metallic ions present in working solutions always mean trouble for chemical researchers, formulators, processors and production men. Often, these troubles are mistakenly attributed to other or unknown causes. Through the new chemistry of chelation, and the proper use of one or more Versene products, you can selectively inactivate the offending contaminants in preferential order. Thus can you prevent them from further interference with the reaction desired.

PREFERENTIAL CHELATION

The table shown here gives the order of chelation of some of the common metals at various pH's in the presence of phosphate and carbonate buffers.

pH 4.0	Cr	Cu	Ni	Pb		Co				
pH 6.50	Ni	Cu	Co	Zn	&	Cd	Ca			
pH 8.65	Ni	Co	Cu	Zn	&	Cd	Ca	Mg	Sr	Ba
pH 11.00	Co	Ni	Cu	Zn	&	Cd	Ca	Mg	Sr	Ba

The metal to the left is more strongly complexed than the metal to the right. A metallic ion that can form a stronger chelate structure with Versene will displace another metal from the chelate compound.

AMAZING ADVANTAGES

The ability of Versene to preferentially chelate metals offers amazing advantages. It can be used in the preparation of pure compounds or to inactivate some metals in the presence of others. With Versene, copper contamination may be removed from acid nickel sulfate solution — without changing the nickel. It permits the preparation of calcium-free magnesium compounds. The procedure is applicable to many separations — including the rare earths, not to mention the development of new analytical techniques. It will pay you to investigate. Ask for technical data and sample.

KEY TO CHELATION

THE DOW CHEMICAL COMPANY

MIDLAND • MICHIGAN

DOW

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Chas. S. Tanner Co., Charlotte, N. C., Greenville, S. C., Knoxville, Tenn.
Kraft Chemical Co., Inc., 917 West 18th Street, Chicago 8, Illinois
Independent Chemical Corp., 79th Place and 71st Ave., Glendale, Brooklyn 27, New York Telephone: TWining 4-0123
Berado & Page, Inc., Houston, Dallas, Corpus Christi, Odessa, New Orleans, St. Louis, Wichita, Oklahoma City, Tulsa, Kansas City, Mo.
George Mann & Co., Inc., 251 Fox Point Blvd., Providence, R. I.
Braun-Knecht-Heimann Co., San Francisco, Calif., Salt Lake City, Utah
Braun Corporation, Los Angeles, California
Van Waters & Rogers, Inc., Seattle, Wash., & Portland, Ore.
European Manufacturing Agent:
Rexolinfabriken Aktiebolag, Helsingborg, Sweden

NEW LITERATURE Continued

Concrete hardener — For treating floors, masonry, for added wear and water resistance. Philadelphia Quartz Co. (F-34)

Air cylinders—Operating at 200 lbs. per sq. in. with bores to 14 ins., strokes to 22 ft. Miller Fluid Power Co. (F-35)

Floor-cleaning equipment—For mills. Vacuum cleaners, floor scrubbers, sanders, furnace-cleaning equipment, cleansing materials. Multi-Clean Products, Inc. (F-36)

After coolers—For compressed-air systems. Remove moisture, oil, dust. Bulletin 711. R. P. Adams Co. (F-37)

Air filters—Low-loss type, high-capacity filters for cleaning industrial air. Bulletin B-100-2A. Farr Co. (F-38)

Cooling towers—For water-cooled air-conditioning systems of 15 to 100 tons capacity. Fast heat transfer. Bulletin 700. Acme Industries, Inc. (F-39)

Indicating Controller—Pneumatically operated controller for on-off use or proportionate control. Bulletin 5A-13. Foxboro Co. (F-40)

GENERAL

Textile standards—"The Why of Textile Standards." Booklet describing sources of consumer complaints. Mellon Institute. (F-41)

Markers—For all surfaces, permanent or temporary. American Crayon Co. (F-42)

Heavy chemicals — Alkalis, organic, and inorganic industrial chemicals. Diamond Alkali Co. (F-43)

Accounting service—For rapid production of statistical information to industry. Statistical Tabulating Co. (F-44)

Factoring service—Booklet describing advantages of factoring accounts. Commercial Factors Corp. (F-45)

Silicone guide—Reference guide to various types of silicones and uses to which they are put. Dow Corning Corp. (F-46)

Organic chemicals—For dyeing and finishing. Detergents, sequestrants, wetting agents. Antara Chemicals. (F-47)

Packaging—Plastics' role in modern packaging. Booklet from Bakelite Co., Div. of Union Carbide & Carbon Corp. (F-48)

Industrial automation—Progress report on present-day extent and future possibilities. General Electric Co. (F-49)

Grounds improvement—Curbing, landscape border products for mill yards, parks, flower beds. Joseph T. Ryerson & Son, Inc. (F-50)

Now Puerto Rico Offers 100% Tax Exemption to New Industry

by BEARDSLEY RUML

"We don't want runaway industries" says Governor Muñoz. "But we do seek new and expanding industries." Federal taxes do not apply in Puerto Rico, and the Commonwealth also offers full exemption from local taxes. That is why 325 new plants have been located in Puerto Rico, protected by all the guarantees of the U.S. Constitution.

Beardsley Ruml

IN A dramatic bid to raise the standard of living in Puerto Rico, the Commonwealth Government is now offering U. S. manufacturers such overwhelming incentives that more than three hundred new factories have already been established in this sunny island 961 miles off the Florida coast.

First and most compelling incentive is the 100% tax exemption for most manufacturers who set up new plants in Puerto Rico.

For example, if your company is now making a net profit after taxes of $53,500, your net profit in Puerto Rico would be $100,000—a gain of 87 per cent, simply because Federal corporate income taxes do not apply in Puerto Rico and all local taxes are waived as well.

Your dividends in Puerto Rico from a corporation there could be $50,000 against $25,000 net in the U. S.—because Federal personal income taxes do not apply either.

What About Labor?

Puerto Rico's labor reservoir of 637,000 men and women has developed remarkable levels of productivity and efficiency—thanks, in part, to the Commonwealth's vocational training schools. These schools also offer special courses for managers and supervisors.

The progress made in technical skills may be gauged from the fact that there are now twenty-eight factories producing delicate electronic equipment.

Among the U.S. companies that have already set up manufacturing operations in Puerto Rico are Sylvania Electric, Carborundum Company, St. Regis Paper, Remington Rand, Univis Lens, Shoe Corporation of America, and Weston Electric.

CORPORATE TAX EXEMPTION

If your net profit after U. S. Corporate Income Tax is:	Your net profit in Puerto Rico would be:
$ 17,500	$ 25,000
29,500	50,000
53,500	100,000
245,500	500,000
485,500	1,000,000

DIVIDEND TAX EXEMPTION

If your income* after U. S. Individual Income Tax is:	Your net income in Puerto Rico would be:
$ 3,900	$ 5,000
7,360	10,000
10,270	15,000
14,850	25,000
23,180	50,000
32,680	100,000
43,180	200,000
70,180	500,000

*These examples are figured for dividends paid in Puerto Rico to a single resident. Based on Federal rates effective Jan. 1, 1954.

"Close to Paradise"

Listen to what L. H. Christensen, Vice President of St. Regis Paper, says:

"The climate is probably as close to paradise as man will ever see. I find Puerto Ricans in general extremely friendly, courteous and cooperative.

"This plant in Puerto Rico is one of our most efficient operations, in both quality and output. Our labor has responded well to all situations."

Mr. Christensen might have added that the temperature usually stays in the balmy 70's twelve months a year.

The swimming, sailing and fishing are out of this world. Your wife will rejoice to hear that domestic help is abundant.

The Commonwealth will leave no stone unturned to help you get started. It will build a factory for you. It will help you secure long-term financing. It will even screen job applicants for you—and then train them to operate your machines.

Transportation

Six steamship companies and five airlines operate regular services between Puerto Rico and the mainland. San Juan is just 5½ hours by air from New York.

Light-weight articles such as radar components come off the line in Puerto Rico one day and are delivered by air freight next day in Los Angeles, Chicago and other mainland cities. And, of course, there is no duty of any kind on trade with the mainland.

Are You Eligible?

Says Governor Muñoz: *Our drive is for new capital. Our slogan is not "move something old to Puerto Rico," but "start something new in Puerto Rico" or "expand in Puerto Rico."*

To get all the facts, and to find out whether you and your company would be eligible for complete tax exemption, telephone our nearest office.

New York	MU 8-2960	579 5th Ave.
Chicago	AN 3-4887	79 W. Monroe
Los Angeles	WE 1-1225	5525 Wilshire

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Mail me "Facts for Businessmen." I am interested in the advantages of Puerto Rico for the industry I have checked.

☐ Electronics ☐ Plastics ☐ Apparel
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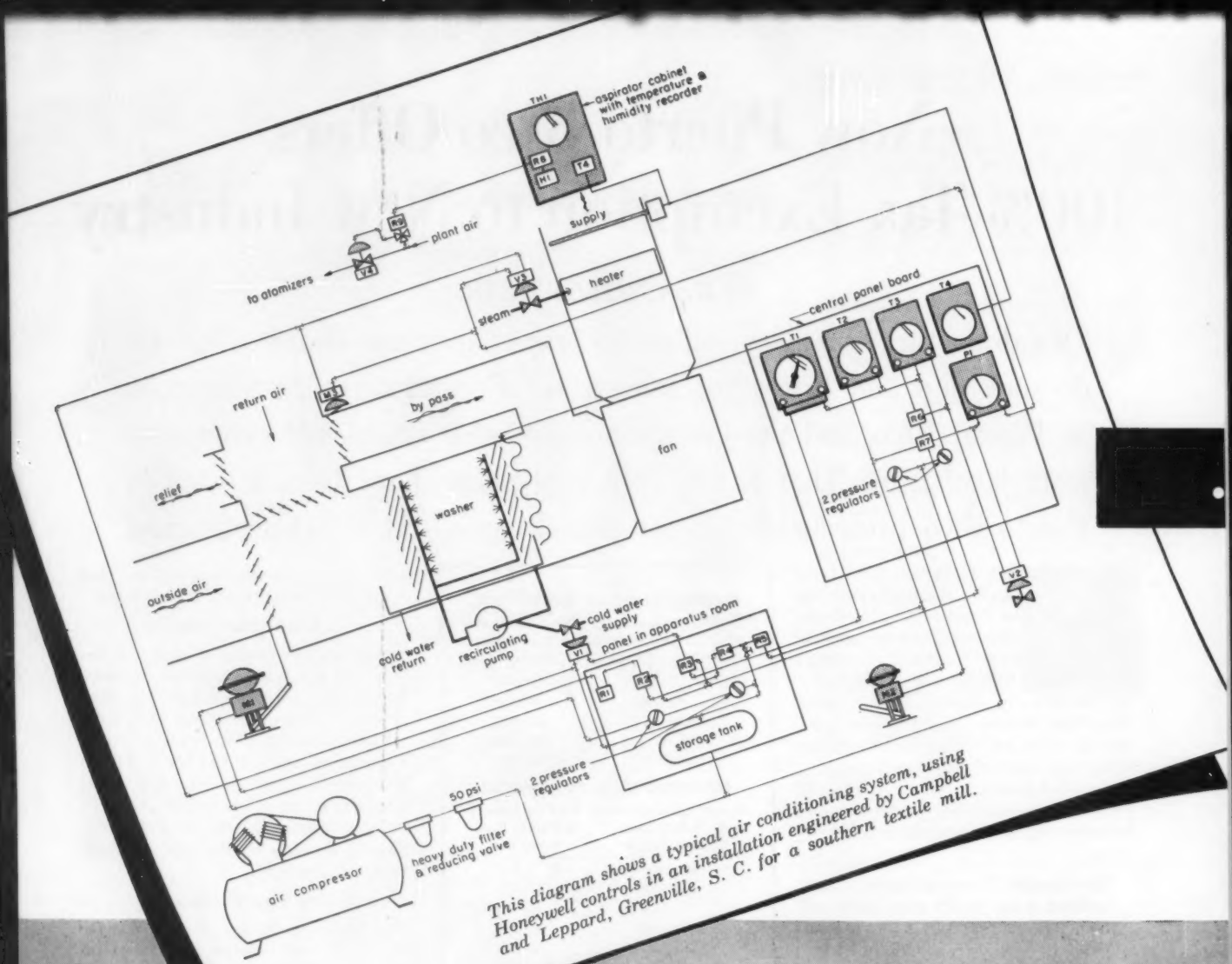
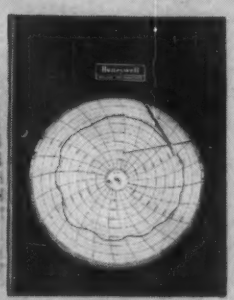


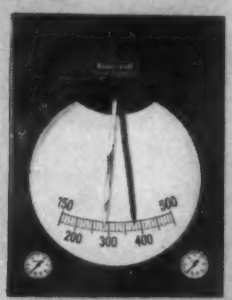
This diagram shows a typical air conditioning system, using Honeywell controls in an installation engineered by Campbell and Leppard, Greenville, S. C. for a southern textile mill.

Honeywell controls for mill air conditioning:

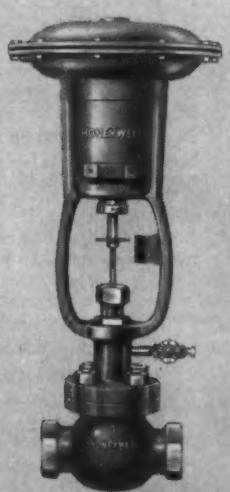
ElectroniK Pneumatic Temperature Controller



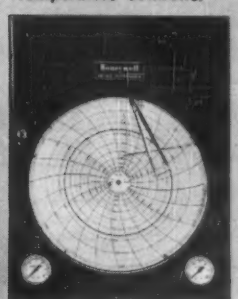
Brown Recording Thermometer



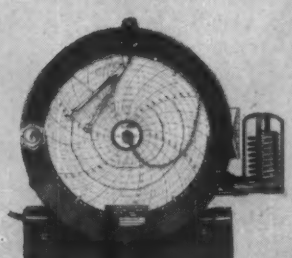
Brown Indicating Pressure Controller



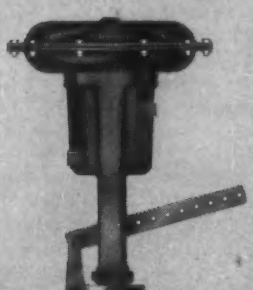
Series 800 Diaphragm Control Valve



Brown Thermomaster Recording Controller



Brown Humidity and Temperature Recorder



***Air-O-Motor* Valve Operators**

. Insure your air conditioning investment

...*with a* Honeywell Control System

IT PAYS to be as particular about your mill's air conditioning controls as you are about process instrumentation. For the precision with which air temperature and humidity values are maintained determines how well you can capitalize on the inherent benefits of modern plant air conditioning. A well-designed system *must* include the best in control . . . to give you high uniformity of strength, pliability and related characteristics of yarn . . . stability of weather-sensitive wood and leather parts in shuttles, pickers and other machines . . . constancy of size formulas . . . production-boosting comfort for employees.

Honeywell repeatedly works in close association with the consulting and contracting engineers who specialize in the development of systems to meet the specific requirements of individual installations. And, Honeywell controls can be incorporated at any stage in the engineering of an air conditioning system. Instrumentation for temperature, humidity and pressure is designed by Honeywell specialists who are qualified to make recommendations by virtue of their familiarity with the needs of the engineering and contracting organization. This experienced staff works out every detail . . . down to valve plug characteristics, interlocks and signalling devices . . . to help provide an integrated control system that will perform at peak efficiency, with minimum operating and maintenance cost.

When you discuss air conditioning, make sure that your consultant or contractor has the complete Honeywell control story.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.—in Canada, Toronto 17, Ontario.

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MINNEAPOLIS **Honeywell**

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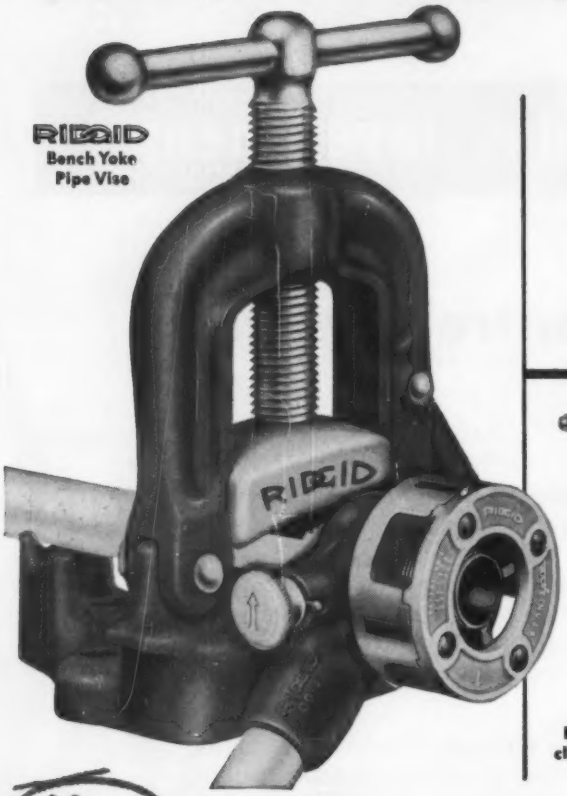
First in Controls

You get *More* for your money when it's a work-saver

RIDGID

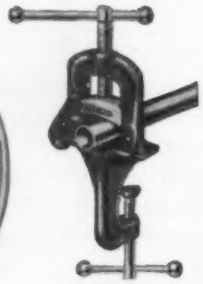
Yoke or Chain Type

Bench, Kit or Post Pipe Vise



RIDGID Bench Yoke Pipe Vise

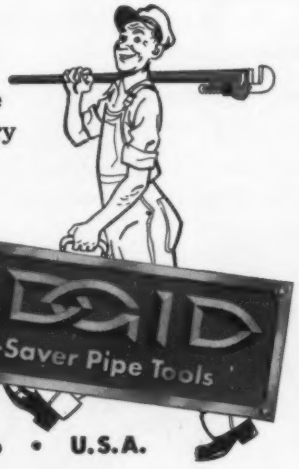
RIDGID Bench Chain Pipe Vise



RIDGID Kit Pipe Vise, portable, clamps on bench or plank

More **efficiency...** special design jaws that grip firmly . . . close and open fast . . . pipe rests for more accurate threading, easy cutting . . . handy pipe benders.

More **service...** famous RIDGID heat-treated jaws for extra long wear . . . special malleable frames that won't warp or break . . . every vise factory tested to assure you super-performance and durability.



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The Ridge Tool Company • Elyria, Ohio • U.S.A.

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PRINCIPLES OF INDUSTRIAL WASTE TREATMENT, by C. Fred Gurnham; John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.; 399 pages, $9.50.

Approaching the subject from an operational or unit-operations point of view, this book deals with the sources, pollutional effects, and methods for the treatment and disposal of liquid wastes produced by industry. The author first deals with the effects of wastes on streams and sewerage systems. Then he examines the criteria developed by the sanitary engineer for evaluating pollution. Physical, chemical, organic, and biological properties are considered separately.

HOW TO PREPARE AN EMPLOYEES' HANDBOOK, by National Foremen's Institute, 100 Garfield Ave., New London, Conn.; 300 pages, $7.50.

This manual is designed as a working tool to save time and money in the preparation or revision of a company handbook. It is bound in loose-leaf form; sheets are easily removed or added as you use the manual to guide your steps in assembling, rejecting and working out the presentation of the material that goes into the handbook. It tells the employer's story to the employee in a way he can understand, appreciate, and accept.

HOW TO SELL AND UNSELL IDEAS, by Fred DeArmond; Lloyd R. Wolfe, 476 Park Ave., Glencoe, Ill.; 237 pages, $7.50.

In this book, the author tells how to convince a customer, a jury, a

It's almost magic, the way Morton can come up with any kind of salt you need in a hurry!

There's really no trick to it. For Morton makes salt for every industrial use under the sun—canning, meat packing, freeze-proofing, water softening, brine making—to mention but a few.

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board of directors, or any audience, regardless of the number. The book is not concerned with the matter but with the manner of conducting a controversy—what to say, how to say it, and how to make your points stick. The author dissects and analyzes the style, strategy, and techniques of the great conversationalists of history; and he spotlights the methods that have achieved success.

BRAND OF THE TARTAN, by Virginia Huck; Appleton-Century-Crofts, Inc., 35 W. 32nd Street, New York, N. Y.; 260 pages, $3.50.

This is the story of Minnesota Mining & Mfg. Co. It is a clear-cut case history in the practical operation of the American free-enterprise system. The record covers roughly the first half of the present century. The firm was launched in northern Minnesota in 1902 to exploit a corundum deposit, which was subsequently adjudged worthless. First success came when the firm started manufacturing abrasives bought from others. The American Institute of Management calls Minnesota Mining one of the five best-managed corporations in the United States.

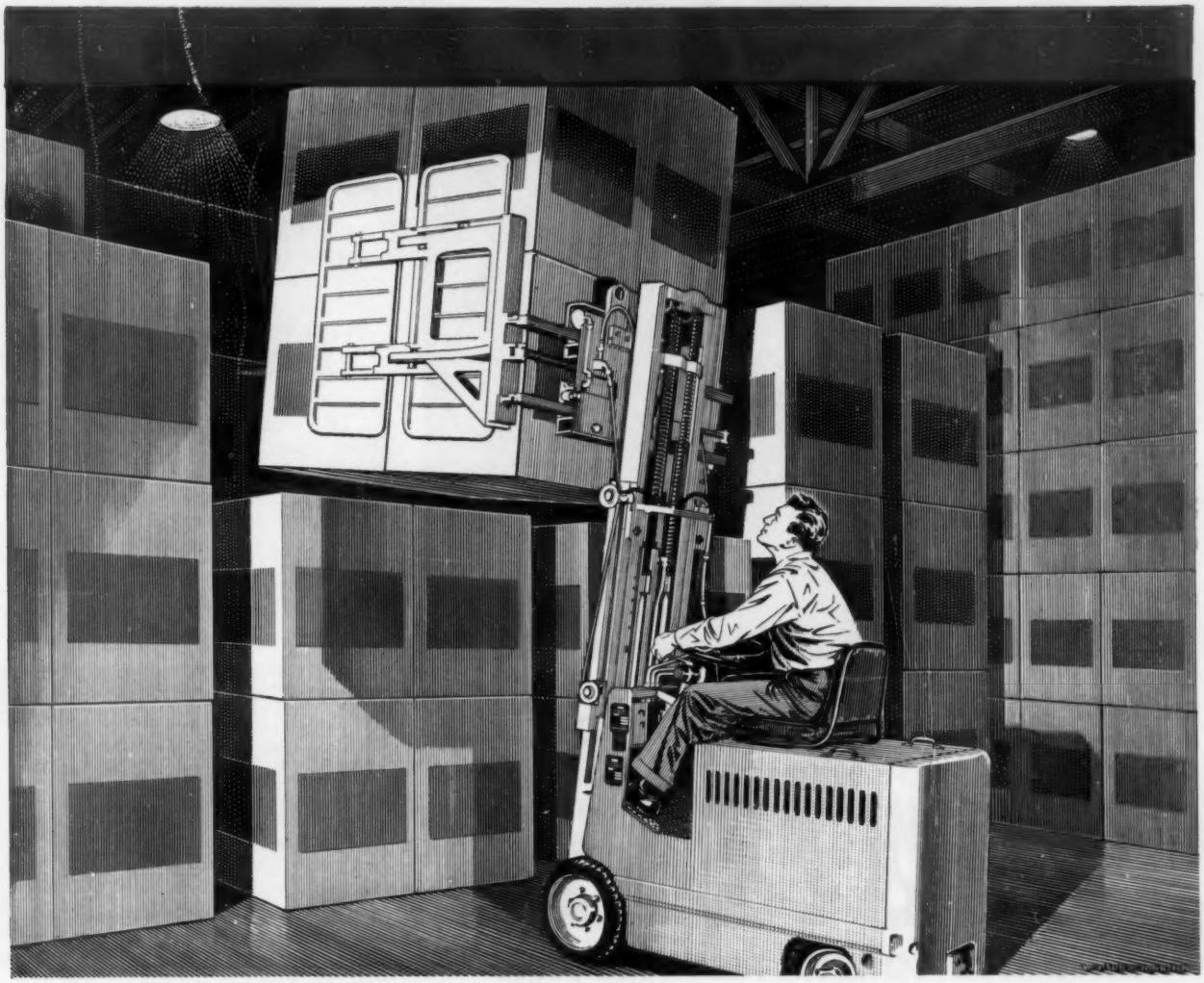
THE STRAIN GAGE PRIMER, by C. C. Perry and H. R. Lissner; McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y.; 280 pages, $6.

This book gives a detailed treatment of strain gauges in everyday language and with a minimum of mathematics. The authors cover the use of these simple and enormously helpful devices in scores of applications and give step-by-step directions for using strain gauges and interpreting the data derived. The presentation of the facts makes it easy to start using strain gauges immediately.

NEW HORIZONS IN COLOR, by Faber Birren; Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y.: 200 pages, $10.

This new book does not confine itself entirely to the use of color in industry. Although it goes into more theory than the average plant man requires, it should prove interesting and valuable to those faced with selecting colors for a new or modernized plant and its equipment. The book gives a clear outline of the physical, esthetic, psychological, and functional aspects of color.

CONTINUED ON PAGE 196



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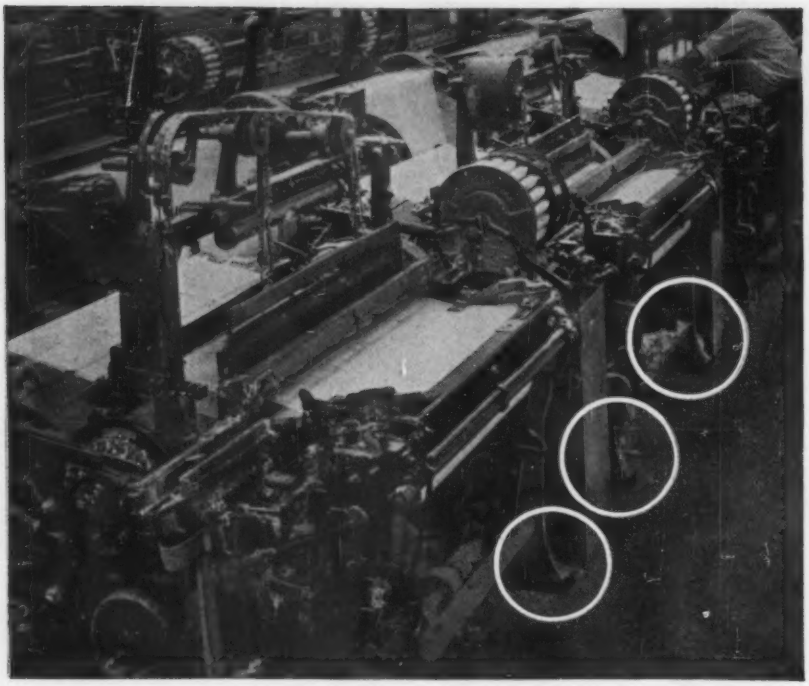

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MANUFACTURERS AND CUTTERS OF WOOL FELTS

BOOK REVIEWS Continued

POWER PLANT MANAGEMENT, by Robert Henderson Emerick; McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y.; 512 pages, $6.50.

For executives, engineers, and supervisors of plants that buy or produce their own power, this book covers a wide range of topics, from the purchasing and use of equipment and its safe and efficient operation to the hiring, training, and supervising of operators.

The reader is shown how objectives, costs, and equipment characteristics should be correlated and evaluated to determine best courses of action; and yardsticks are given for measuring the effectiveness of management and supervisory performance.

TEXTILE CALCULATIONS, by N. C. Gee; The British-Continental Trade Press Ltd., 222, Strand, London, W. C. 2, England; 255 pages, $2.94.

This book deals in a simple manner with calculations of yarn number conversions; yarn testing; warp, filling, and fabric weights; blending, carding, spinning, weaving, and winding output; cloth setting; and cloth weights and conditioning problems. For the first time, the work of several investigators of cloth setting appears in one volume. Students and designers should find this book useful.

EVALUATION OF EXPERIMENTAL WOOL-SYNTHETIC BLENDS IN AIR FORCE 18-OZ. BLUE SERGE, by Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.; 26 pages, 75¢.

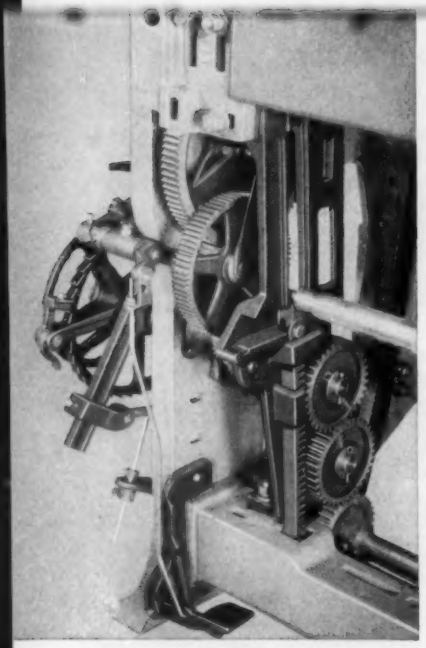
To achieve economy in wool-fabric production and to produce a better, longer-wearing fabric, the Air Force has conducted a series of experiments with wool-synthetic blends. The results of the experiments are contained in this report, which shows that certain synthetic fibers increased breaking strength and abrasion resistance. However, the addition of all synthetic fibers increased the rate of burning and decreased wrinkle recovery. The tests apply only to standard 18-oz. blue serge.

He Just

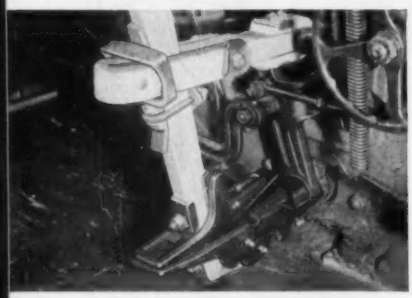
ROUND TABLE

CONTINUED FROM PAGE 10

semiweekly meetings between the

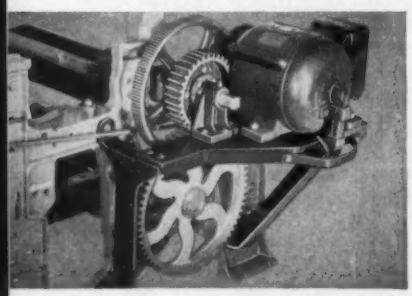


THE RATCHET TAKE-UP permits more accurate yarn control . . . makes it easier to match the pick.

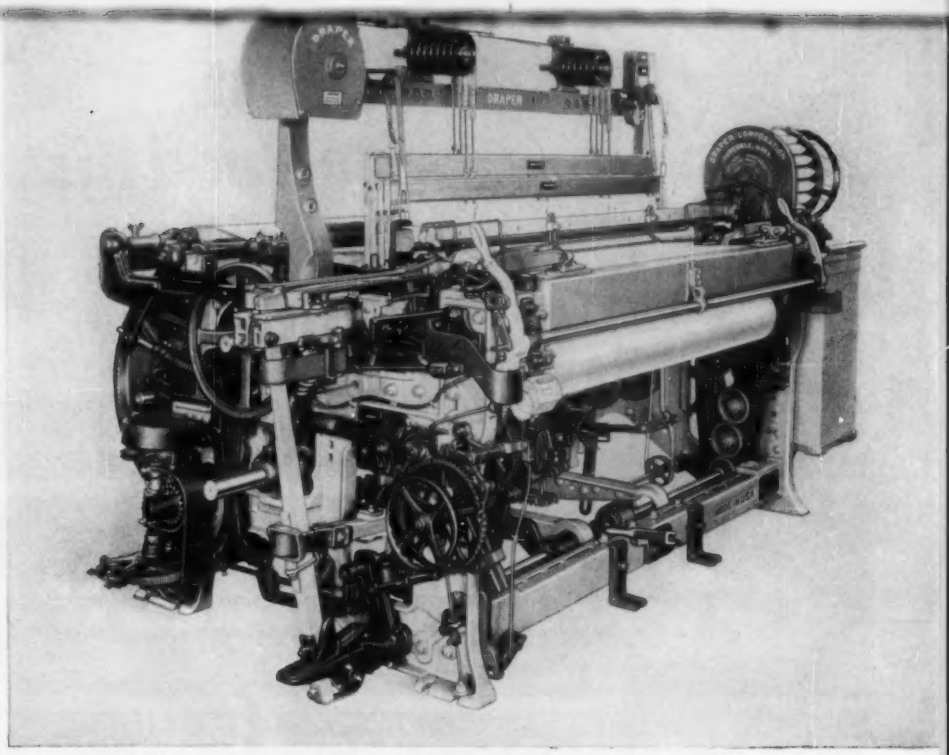


PIN AND SLEEVE TYPE PARALLEL provides a more positive, easier picking action . . . reduces wear on all component parts.

ONE-PIECE CAM, contour milled for more accurate pick-motion control.



THE DRAPER-DIEHL Power Transmitter . . . a compact power unit providing greater weaving efficiency with less maintenance.



DRAPER X2 HIGH SPEED AUTOMATIC LOOM

THERE'S A DIFFERENCE IN LOOM REPAIR PARTS AND MECHANISMS

It may be in over-all cost, application, service or loom performance. But, whatever the difference — *you* will benefit by using only repair parts or mechanisms that are manufactured by the original loom builder.

Draper repair parts or mechanisms *either duplicate exactly* or *improve* the original parts on your Draper looms. Increased production, lower maintenance and reduced costs are *big differences* which become evident when you use Draper repair parts.

For the best performance . . . use Draper repair parts exclusively on *your* Draper looms.

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ATLANTA, GA. GREENSBORO, N. C. SPARTANBURG, S. C.

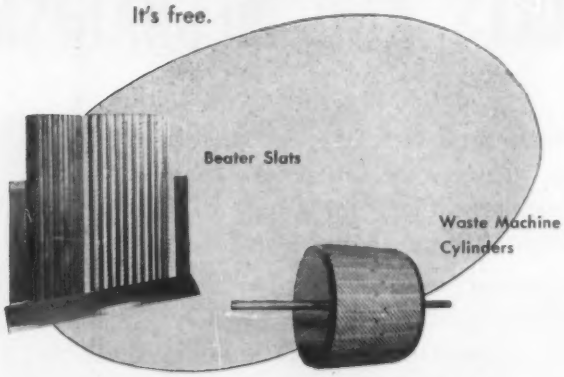
He Just *Doubled* His Opening Efficiency*

*Case History in a Leading Mill

This superintendent's opening machinery was in good order. Aprons were of good quality and up to original specifications, yet cleaning efficiency was low. Respacing of the apron slats and the use of new pin sizes, as recommended by Dodenhoff engineers, doubled his opening efficiency overnight.

Changing conditions call for new apron specifications in at least 30% of our mills. Dodenhoff engineers are well qualified to survey your needs and make the right recommendations, because Dodenhoff makes the machinery in which aprons are used and these engineers are familiar with apron requirements.

Changeovers recommended by Dodenhoff have greatly improved opening production in many mills in the United States and Canada. Make sure your aprons are right by asking for a Dodenhoff survey. It's free.



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highest quality . . . all belting cut from center of the hide in our own shops.

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W. D. DODENHOFF CO.
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ROUND TABLE

CONTINUED FROM PAGE 10

semiweekly meetings between the operators and their immediate supervisors. Then, carry this expert information all the way up by having weekly meetings between all the supervisors and the superintendents.

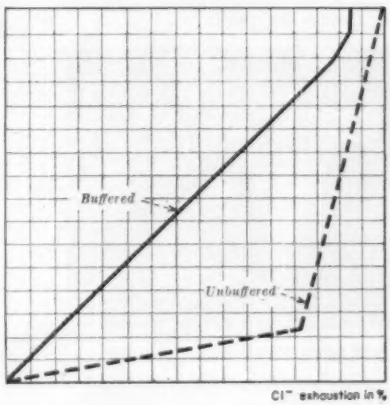
The results will surprise you.

SUMMEY M. CAUBLE, JR.
Assistant to Manager
Valdese Mfg. Co.
Valdese, N. C.

CORRECTION

[In a chart used with the article "Tips on Chlorination of Wool" [TW, Oct., '55, p. 126] the words "Buffered" and "Unbuffered" were transposed.

*To clear up any confusion that may have resulted, we are printing the corrected chart and its explanatory caption below.—*EDITOR]



BUFFERS such as Hypak or polypeptides have a marked effect on the rate of absorption of chlorine by wool, as shown here. The difference between unbuffered solutions and solutions containing 0.5% polypeptides owg. is shown in this chart.

INTERFERENCE TABLES

CONTINUED FROM PAGE 136

internal work of total amount $t_1 + t_2$, and often it can be deferred (as in Case 2); but it has to be done eventually even at the cost of leaving a stopped machine waiting (Case 3).

The only difficulty is in estimating how much of the total internal work is t_1 and how much is t_2. Assume that t_1 and t_2 have been estimated and each amounts to 0.20 hr. The cycle time and B_e are calculated as in Case 3: $H = 13.55$ and $B_e = 0.885$.

Now calculate the load of the underprivileged internal work, B_i:

$$B_i = N \times \frac{t_2}{H} = 8 \times \frac{0.2}{13.55} = 0.118.$$

But this makes the total load B equal 1.003 (sum of 0.885 and 0.118). So it is evident that a stand-

less maintenance.

NALEX WARP SIZE

lowers humidity to 70%

FOR SPUN RAYON, COTTON AND WORSTED YARNS

NALEX assures excellent weaving efficiency at relative humidities as low as 70%. Often even lower.

NALEX cooks quickly A minimum of size compound is needed. Film forming properties are excellent.

NALEX penetrates readily, which is necessary for combed yarns and high sley constructions.

NALEX minimizes "seconds" by eliminating "hard size, warp clinging, fuzz balls," etc. High quality fabrics can be produced week after week.

LOW HUMIDITY means better working conditions, lower maintenance costs, and a cleaner weave room.

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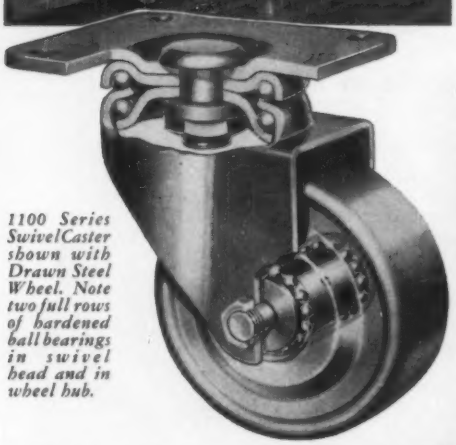
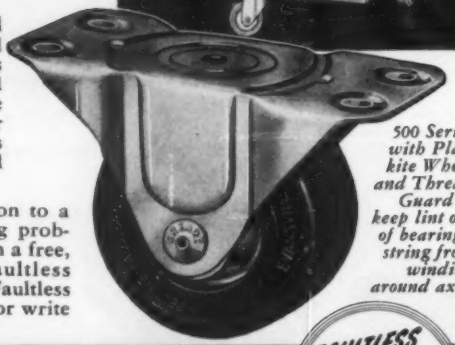
Advanced engineering methods of servicing over 64,000 spindles at the mills of Russell Mfg. Company have helped them to be recognized as one of the South's most enterprising textile mills. The continuous productive operation of textile machinery depends to a large extent upon keeping the equipment supplied with work materials. Keeping work material on hand and feeding it into the spinning machinery speedily is accomplished at Russell Mills with a combination of integrated trucks. And to assure these trucks a trouble-free, continuous cycle through every phase of mill operation, the Russell executives selected Faultless 504-4TG rigid plate and 1104-4TG Double Ball Bearing Swivel Casters with drawn steel wheels.



1100 Series SwivelCaster shown with Drawn Steel Wheel. Note two full rows of hardened ball bearings in swivel head and in wheel hub.

Faultless castered equipment can lead the way to reduced costs and increased production in *your own plant.* Casters for light, medium, heavy and special duties are included in the extensive Faultless line. Faultless wheels for every type floor and load, as well as for special temperature and chemical conditions, are available.

Each month the solution to a real materials handling problem is fully presented in a free, handy size folder "Faultless Facts." Ask your local Faultless Distributor for copies or write to us, no obligation.



500 Series with Plaskite Wheel and Thread Guard to keep lint out of bearings, string from winding around axle.

FAULTLESS CASTER CORPORATION
EVANSVILLE 7, IND.
Offices in Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Dallas, Detroit, Grand Rapids, High Point, Houston, Indianapolis, Los Angeles, New York, Philadelphia, St. Louis, Canada: Stratford, Ontario.

FAULTLESS SOLVES THE TOUGH JOBS

equal 1.003 (sum of 0.885 and 0.118). So it is evident that a standard operator cannot accommodate this amount of internal work without giving it more priority. The situation would clear itself by making t_3 smaller and t_1 correspondingly bigger until the cycle time is stretched enough to accommodate t_2. A small change would do the trick.

If t_1 became 0.22, the cycle time would be 13.65 and B_s would be 0.89. With t_2 at 0.18, B_1 would be 0.1056, making the total $B = 0.9956$. All is well again.

In conclusion, one point should be made clear. To the tables, it makes no difference whether you use the 60/80 system, the standard-pace system, or any other. It makes no difference whether your men are on incentive or not.

Just as, when you use tables of logarithms, you feed figures in and you get figures out, so it is with these tables. In neither case are the tables the least bit concerned with where you got your original figures or how you interpret the answer you get from the tables. Those are matters that have to be decided on other considerations.

TRICOT CALCULATIONS

CONTINUED FROM PAGE 129

Where: Rt = top runner
Rb = bottom runner
R = racks per piece

To figure the pieces of fabrics your yarn will knit, divide the total warp length by the length to knit one piece. For example, assume that 4,500 lbs. of 30-den. nylon yarn is in stock and the fabric is to be knitted to specifications of the previous order:

$$\text{Total warp length} = \frac{4{,}500 \times 4{,}464{,}500}{30 \times 4{,}696}$$

$$= 142{,}605 \text{ yds.}$$

$$\text{Length to knit 1 piece} = \frac{(58+44)}{36} \times 400$$

$$= 1{,}133 \text{ yds.}$$

$$\therefore \text{Number of pieces} = \frac{142{,}605}{1{,}133}$$

$$= 125 \text{ pieces}$$

The yarn requirements for setting up the creel must be accounted for.

These formulas can also be used for cotton yarns, but the cotton yarn must be converted to the denier system. You can rapidly convert cotton system into denier system by checking TEXTILE WORLD's 1954 Fact File, pages 7 to 10, or using the conversion figure of 5,315.

A slide rule will hasten these calculations and will give accurate-enough results.

FOR RESEARCH LABORATORIES

BATTERY OPERATIONS

Working with The Carborundum Company, American Viscose helped develop a revolutionary sand screen to replace conventional abrasive discs. It has a useful life 7 to 15 times greater for two reasons: First, the removed material flows out through the open mesh. Second, it is made from Avisco filament rayon yarn that stays "young and muscular" even when loaded with phenolic resins and abrasives. The result is an abrasive far more useful to you.

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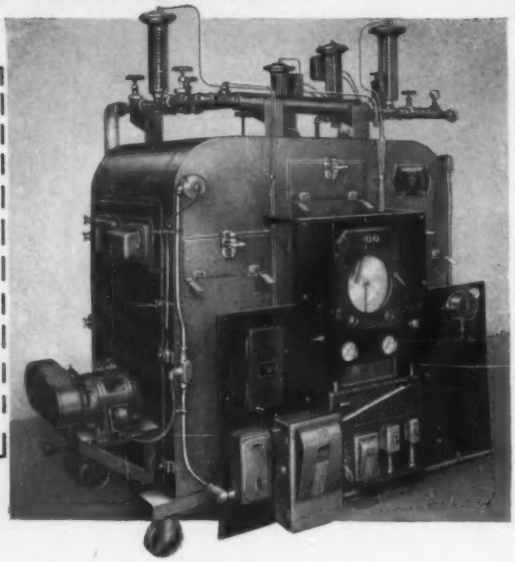
THE NEW **Portable LAB DRYER by SARGENT**

FOR OUTRIGHT PURCHASE or on a SENSIBLE RENTAL-PURCHASE PLAN



FULL SIZE — 8′-6″ high x 8′-0″ wide x 6′-7″ deep.

MOBILE — mounted on heavy-duty ball-bearing casters that lock securely into position.

FLEXIBLE, VERSATILE — for steam or electrical heating of air stream. Material tested in trays, suspended from poles, on rolls, or any combination.

INSTRUMENTED FULLY and completely — ready to go to work for you without delay.

Modeled on the famous Sargent-developed, designed and built, research dryer used in Sargent's own drying research laboratory.

Here, at last, is a dryer to help you solve those constantly recurring and ever different drying problems of new fibres, new blends, new fabrics. Simple to operate. Accurate at every setting. Fantastically flexible in its ability to reproduce any combination of factors influencing drying of stock. Automatic or manual operation.

We believe the new portable lab dryer is equipped with more positive controls and a more simplified method of changing drying conditions within the machine, than ever before offered.

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CHARLOTTE, N.C. — W. S. Anderson, Carolina Specialty Co.
ATLANTA, GA. — J. R. Angel, Mortgage Guarantee Building
TORONTO, CAN. — Hugh Williams, 47 Colborne Street

BATTERY OPERATIONS

CONTINUED FROM PAGE 131

spections reveal a damaged cell, repairs should be made immediately, both to prevent further damage and to bring the battery back to maximum efficiency. If damaged cells are not replaced at once, the battery does not deliver full capacity; and the other cells must stand harder duty to make up for those that are defective.

The battery-room foreman should be familiar with repair techniques. A small supply of spare parts, such as jars, covers, and connectors, should be kept on hand together with the proper instruments and tools.

In addition to a small office for keeping charging records safe, the battery room should have means of lifting batteries in and out of trucks.

A set of standard and special tools and instruments for making battery adjustments and repairs should be available. Spare parts to get damaged cells back into service quickly will usually pay off. Water and compressed air for cleaning are useful. A source of distilled water, if local public water is not usable, is a must. Sulfuric acid for storage-battery use is essential.

Efficiency drops rapidly after a cycle-duty battery has been in service so long that it delivers less than 85% of its rated capacity. When this point has been reached, it is advisable to replace the battery to prevent work stoppages and to avoid extra charging operations and wasted power.

ON SAME MACHINE—

CONTINUED FROM PAGE 140

machine. The speed of the forms depends on the operator's ability and the time required for the goods to be in the setting chamber. The operator sets the speed adjustment by turning a handwheel. The wheel moves the motor to increase or decrease the pulley size.

Trough Holds an Hour's Work

Goods to be preboarded are untied and placed loosely in the aluminum trough on the front right side of the machine with the toes facing the operator. Up to 40 doz. men's socks are placed in the trough at one time, and the goods slide down as the operator processes the socks from the lower end of the pile. One loading of the trough lasts about 1 hr.

When the machine is set up for preboarding, a hamper is placed under the rotating forms. One sock is drawn on the form and a preboarded sock is stripped from the form to

fall in the hamper.

Shorten Your Process Time

with

U. F. CONCENTRATE – 85

(59% Formaldehyde – 26% Urea)

If your process needs high concentrations of both formaldehyde and urea use Nitrogen Division's U.F. Concentrate—85 – the highest available concentration of liquid formaldehyde—59% Formaldehyde, 26% Urea. Active content is 85% by weight.

There are many advantages:

- **Increase production in shorter time with existing equipment.**
- **Reduce processing time for dehydration.**
- **Charge larger batches to kettles.**
- **Pump U.F. Concentrate—85 using your regular formaldehyde facilities.**
- **Save storage, handling and shipping costs.**

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Clinton starches are widely used for warp sizing. They increase strength . . . smooth fibers so abrasion is reduced . . . resulting in smooth running warps. And that's only the beginning. At the finishing operation, Clinton starches provide proper hand and body to your fabrics.

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. . . and remember technical service in connection with your specific problems is available upon request

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CLINTON

CLINTON FOODS INC.
Corn Processing Division
CLINTON, IOWA

fall in the hamper.

A metal tray is clamped to the machine and the hamper is removed when goods are to be final-boarded. As the socks are removed from the forms, they are laid on the tray. A counter is operated by the left hand as the operator lays each sock on the tray.

A bell rings at the completion of 12 socks. On the second ring of the bell, the dozen pairs of socks are placed on a mobile table on the girl's left side.

Machine Sets Pace

Except for making machine adjustments, an operator has no walking to do. A low wooden platform was built for her comfort. If the speed of the machine is set too fast, the operator may miss placing an occasional sock on the form; but the set speed does provide an incentive and sets the pace for her to work.

The dry heat has been found particularly useful for stretch nylon socks, as it does not distort the sock from its original shape. The elasticity is not destroyed, and the sock retracts to the size it was originally knitted for.

Before cotton socks are boarded, they are extracted to leave 30% moisture in the goods.

The machine is plugged in the normal power circuit. Because no steam is used, the power cost for 300 doz. socks has been worked out to 65¢.

The machine, which is supplied by Southern Mill Equipment Corp., was developed by W. E. Rascoe and Frank S. Southerland, president of Southern Dyeing and Finishing Mill.

COTTON TESTING

CONTINUED FROM PAGE 132

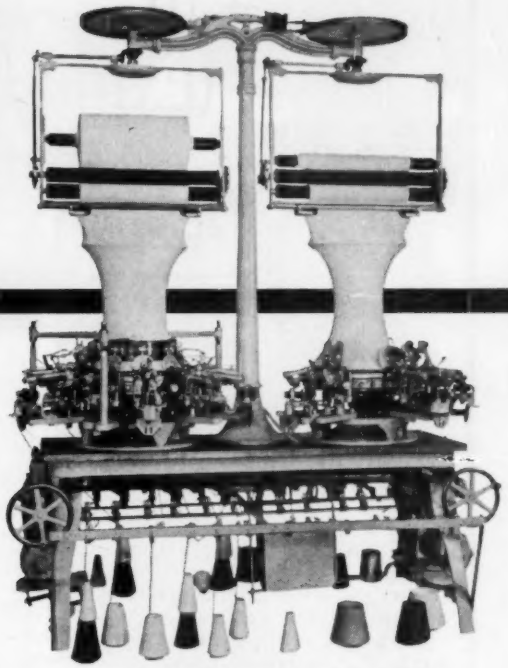
we're in doubt.

When the Speedar reading is outside our standard, we check the sample on the Micronaire to get a result that the shipper understands. The bales, when they arrive, go through the same testing procedure described above; two samples are tested, each from an opposite side of the bale.

Speedar Triples Tests Made

The Speedar processes samples almost three times as fast as our former testing method did. It requires two operators: one prepares the sample and the other does the actual testing. It is unnecessary to weigh the sample accurately, a factor that speeds up the work so much.

Here's how we use the unit at



THE TORRINGTON COMPANY
Torrington, Conn., U.S.A.
Established 1886

TORRINGTON NEEDLES

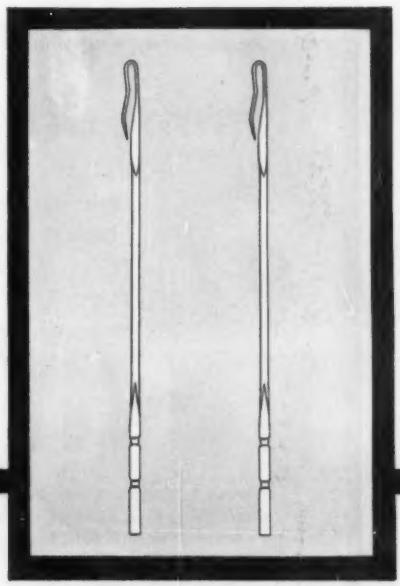
help users profit from the versatility of the high-speed Tompkins D-2 Machine . . .

in which new stop-motion and furnishing wheels prevent imperfect feeding of yarn to needles—catch potential flaws before they get into the cloth!

"To help get finest results from our D-2 and our other precision machines, we use and recommend Torrington Needles," says Mr. W. A. Ingalls, General Manager of Tompkins Bros. Company. "They consistently demonstrate their dependability, good performance and long service life."

Actually, these qualities are "built into" Torrington Needles, which are precision-made to insure absolute uniformity, exact temper and smooth finish.

Whatever *your* needle requirements—for whatever type of machine—you, too, can benefit from the use of Torrington Needles. Their significant contribution to smooth machine operation and flawless knitting pay off in labor and time saved . . . and profits earned! Just call your nearest Torrington office for prompt deliveries or expert advice on any needle problems.



There's a **TORRINGTON NEEDLE**

for every machine . . . for every type of knitting!

the big 4 in textile flake soaps

VIDOL ----------→ low titre

Puritan ---→ medium titre

EXCELSIOR -------→ high titre

pure green olive -----→ medium titre

• More and more dyers and finishers are taking advantage of the plus values of these and other members of the Laurel Soap family (*Texsopon, Columbia, Palm-type, Arrow, and Crown*), for better scouring, fulling, and soaping off.

That clean lofty wool; those soft, perfectly fulled woolens and worsteds; clean, bright prints and vat and naphthol dyeings; completely degummed silks . . . all these can be yours with a Laurel Quality Soap.

For your convenience, you can obtain Laurel *Quality* Soaps from stocks at Philadelphia, Pa., Charlotte, N. C., Chattanooga, Tenn. and Paterson, N. J.

Laurel Quality Soaps are available in powder, bar, solid and paste (potash) forms. Ask for samples.

Laurel SOAP MANUFACTURING CO., INC.
TIOGA, THOMPSON & ALMOND STS., PHILA. 34, PA.

Laurel Brand

STEEL

Every kind in stock

Immediate shipment

Principal Products: Bars, Structurals, Plates, Sheets, Tubing . . . Carbon, Alloy and Stainless Steels, Machinery and Tools, etc.

RYERSON

Joseph T. Ryerson & Son, Inc. Plants at: New York, Boston, Philadelphia, Charlotte, N. C., Cincinnati, Cleveland, Detroit, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco, Spokane, Seattle

Swift: One girl places the sample between two special fingers on the machine. The weight of the sample depresses an indicator. The second girl, by turning a wheel on her side of the Speedar, brings a second indicator in line with the first, which adjusts the testing cylinder to the sample weight. The sample-weight limits are 72 and 150 grains.

The second girl removes the sample from the weighing fingers and puts it into a cylinder, pulls a lever, and notes the fineness on the gauge. If the sample meets standards, she doesn't record the results. However, if the sample is outside the limits, she records the reading and later checks the sample on the Micronaire.

Loom Binders

CONTINUED FROM PAGE 127

If the binder is stored for several days, give the facing another coating of dressing before it is put in a loom. A coating of shellac or varnish will help preserve the wood binder.

Don't Mix Binders

Before a binder is put in a loom, be sure it is the correct binder for the model of loom. Binders are made in several sizes and shapes; and although one will fit a loom, it may not be best suited for the weaving conditions. Be sure the binder fits snugly but freely in the back box plate. See that the box-plate extension doesn't bind it.

Examine the binder spring. If the end is worn or broken, it may damage the binder; so discard it. Set the binder-spring tension just heavy enough to hold the binder firmly in place. If the binder spring is used to check the shuttle, the binder and shuttle both wear unnecessarily.

Before the binder bolt is tightened, turn the eccentric brushing so that the shuttle is centered in the shuttle box. To determine this position; use a shuttle-centering gauge. Stand directly over the box and turn the bushing until the point of the shuttle spur is exactly over the center of the slot in the lay end.

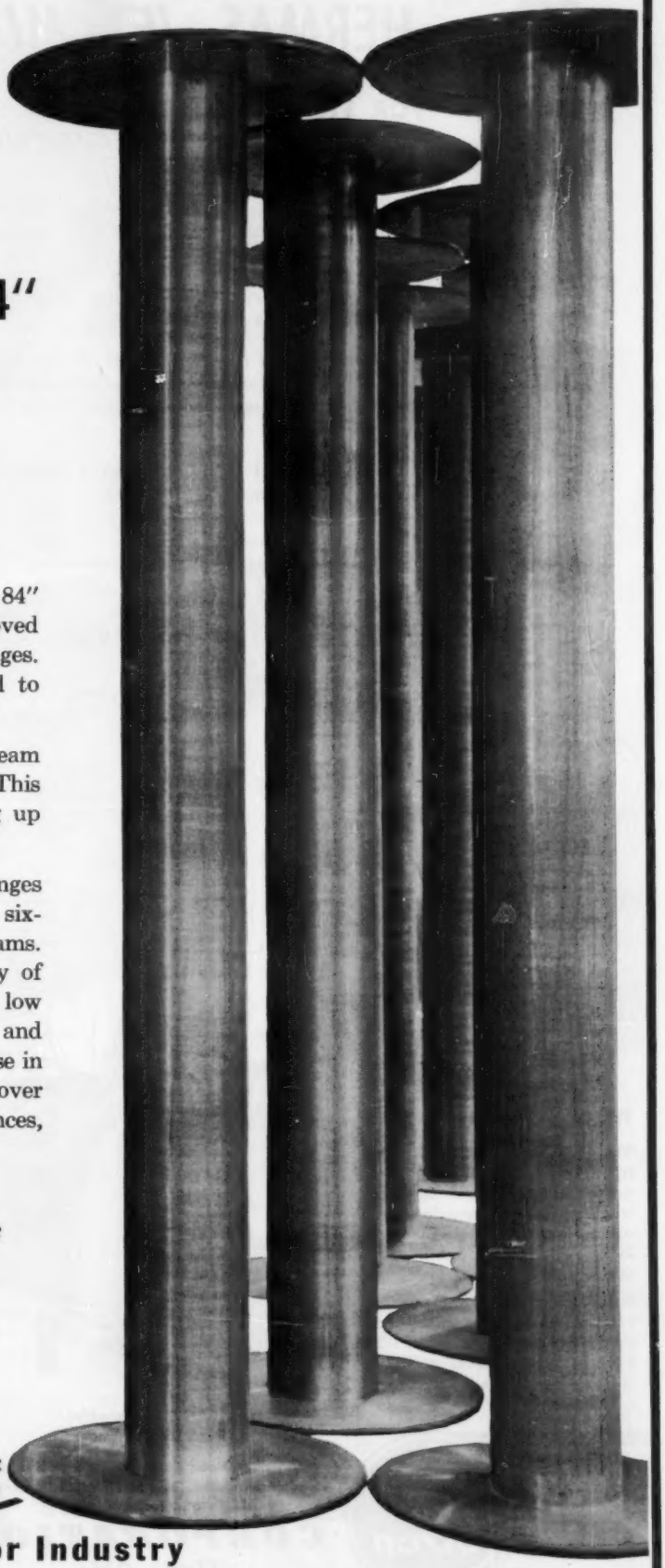
Inspect Binders in Looms

Binders should be inspected at least once each week. They can be checked during the weekly shuttle inspection. At this time, inspect binders for wear and coat the facing with dressing.

Binder wear often occurs because one or more loom motions are out of adjustment. Binder inspection and maintenance make binders last longer and increase their efficiency.

The length of serviceable life of a binder depends on several factors: (1)

New Celanese 21″ x 84″ Beams offer definite advantage to tricot knitting trade



Trial shipments of knitting sets on 21″ x 84″ beams indicate simplified handling, improved quality and increased production advantages. The 84″ beams will shortly be offered to the trade.

Simplified Handling: The bigger beam means fewer beams to handle per set. This results in easier loading and threading up of machines.

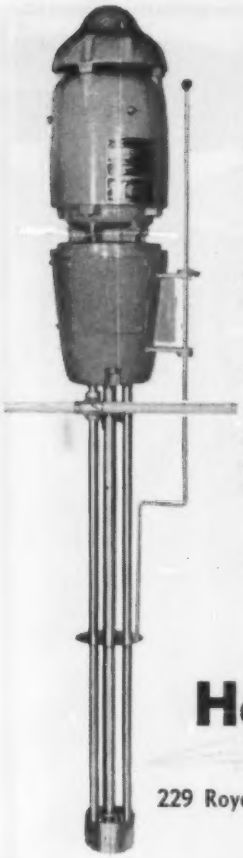
Improved Quality: Gained because flanges are reduced by respectively eight and sixteen when compared with 42″ and 21″ beams. Flange reduction lessens the possibility of causes for defective fabric as high or low edges causing streaks; broken filaments and ringers due to flanges or edge ends (these in turn cause drag marks); high and low cover bands from varying beam circumferences, tapered beams or high or low edges.

For further information, write Celanese Corporation of America, Textile Division, Charlotte, North Carolina.

*Reg. U. S. Pat. Off.

Celanese*

Fibers for Industry



HERMAS *JET MIXER*

FOR FINE PARTICLE SIZE BREAKDOWN . . .

Because particle size is so fine when you mix in the Hermas Jet Mixer, the product is more stable. It does not tend to settle out.

There is no vortex, no foaming, no entrapped air when this mixer is employed.

This mixer has application for mixing of pigment colors, latex solutions, and wax emulsions. Because it actually homogenizes, it has unusual value for mixing starch sizes.

The Hermas Jet Mixer will handle viscosities up to 50,000 centipoises.

For complete details,
write for four page illustrated folder today.

Hermas Machine Co.

Mixer Division

229 Royal Avenue — Hawthorne, N. J.

The *COLSON*
"Handler"
Really Gets Around!

...even in busy, narrow aisles

The COLSON "Handler" turns in its own length, weighs (and costs) only ½ as much as a fork truck and lifts and carries loads up to 4000 pounds. Just one lever does it all . . . shifts, lifts and brakes.

Before you buy a more expensive piece of equipment, make sure that the "Handler", only $1395 F. O. B. Elyria, Ohio, won't do the job just as well — or better.

Write for free booklet "The COLSON Handler"

Casters • Hand Trucks • Lift Jack Systems
Hydraulic, Electric and Mechanical Power Lifts and Transports

THE Colson *CORPORATION*
Elyria, Ohio

binder depends on several factors: (1) type of loom, (2) loom speed, (3) shuttle-box settings, (4) fabric woven, (5) condition of the shuttle, (6) picking-motion settings, (7) checkstrap settings, (8) temperature and humidity, and (9) type of leather used.

Correction

On page 138 of the October, 1955, issue in "How Blumenthal Processes Specialty Worsted Yarns," a gill reducer was erroneously called a pin drafter. The picture and a corrected caption are reproduced below.

GILL REDUCERS are used on 100%-synthetics stock only, except for some top that is blended at the dyehouse. Preblending for the gill reducers would mean an extra operation. Blumenthal has three sets of gill reducers, which it considers sufficient for a specialty mill because blending is not done on the gill reducers.

EQUIPMENT & SUPPLY NEWS

CONTINUED FROM PAGE 166

Fisherman's Knotter

Cook & Co. Ltd., Manchester, England, has appointed Stellite American Co., 60 E. 42nd St., New York 17, N. Y., agents for its hand-model knotter. The machine makes a fisher-

LIKE ALL KEMCO MATERIAL HANDLING PRODUCTS
THESE PIN TRUCKS ARE ENGINEERED

HOW STAINLESS STEELS BOOST DAY-TO-DAY SAVINGS in textile production

Crucible Rezistal® Stainless Types for Textile applications

STAINLESS TYPE	NOMINAL % Cr	Ni	Other	USED FOR
302	18	8		General Purpose
303	18	8	S	Free-machining
304	19	9	Low C	Welding
309	25	12		High Temperature
310	25	20		Higher Temperature
316	18	12	Mo	High Corrosion-resistance
317	19	13	Mo	Higher Corrosion-resistance
318	18	12	Mo, Cb	Welding (stabilized)
321	18	8	Ti	Welding (stabilized)
347	18	8	Cb	Welding (stabilized)

To plant and mill operators, stainless steel is not a luxury metal—but the most economical construction material they can use wherever there's need for its exceptional corrosion-resistance, strength and cleaning ease.

Add to these properties its remarkable resistance to wear and abrasion—and you can see why Crucible stainless steels mean longer service life, increased production, reduced maintenance and cleaning time, fewer replacements and repairs...throughout the textile plant.

See how stainless steel can boost day-to-day savings in your plant. Get practical, economy-minded advice on stainless selection, fabrication and maintenance in your free copy of "Making the Most of Stainless Steels in the Textile Industry." Send for it today. Or call your local Crucible representative. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

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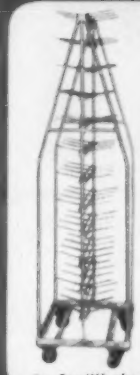
KEMCO

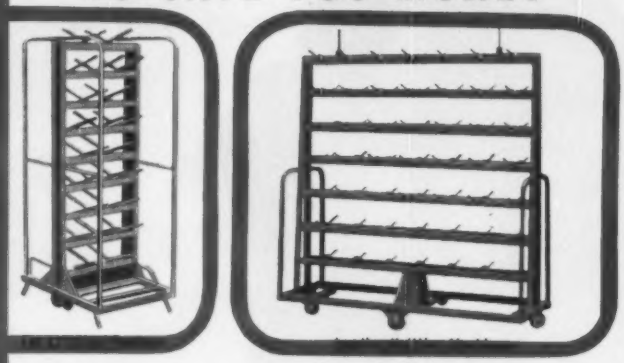
LIKE ALL KEMCO MATERIAL HANDLING PRODUCTS

THESE PIN TRUCKS ARE ENGINEERED

TO SAVE YOU MONEY



For Conditioning



● You can save a lot of time, a lot of money by efficient package handling yet *so many* mills fail to take full advantage of such savings.

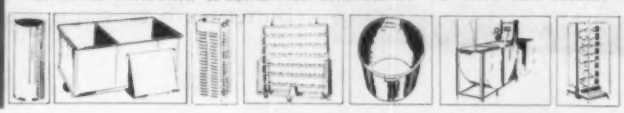
Check *your own* package handling methods and equipment; then have us show you how we've saved money for dozens of the most efficient mills . . . and can cut your costs.

Forty years of specialized textile experience enables us to design and build pin trucks that, thru package separation end scuffing and spoilage . . . that provide maximum load capacity . . . save time, labor, money. Illustrated are a few of many trucks—built to clear even the narrowest aisles.

WORTH INVESTIGATING because today more than ever, profits depend upon holding down maintenance costs. Write for detailed information today.

KENNETT EQUIPMENT AND MACHINERY COMPANY
Kennett Square
Pennsylvania, U. S. A.

MATERIAL HANDLING SPECIALITIES ENGINEERED TO SAVE YOU MONEY

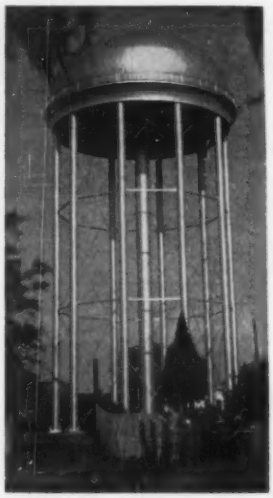


HAE-K

TANKS AND VESSELS
FOR THE
TEXTILE INDUSTRY

● COLE builds elevated tanks and vessels to your specifications — dye-vats, kiers, starch-kettles, acid tanks, jib-boxes, or other processing vessels for the finishing and dyeing industry . . . in stainless steel, nickel-clad steel, or of standard steel lined with Monel metal.

Our long experience in the design and fabrication of vessels for the textile industry may be of help to you. Write for latest COLE catalog—*Tank Talk*.



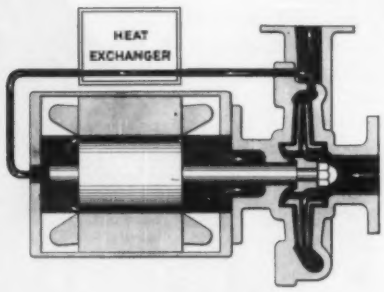
Established 1854

R. D. COLE Manufacturing Co., Newnan, Ga.

● TANKS
● TOWERS
● CYLINDERS
● VESSELS
● STANDPIPES

ican Co., 60 E. 42nd St., New York 17, N. Y., agents for its hand-model knotter. The machine makes a fisherman's knot, said to be particularly efficient for worsted yarn.

Circle T-20 on Reader-Service Card



Sealless Cooled Pump

An addition to the line of sealless Chempump products has been introduced by Chempump Corp., 1300 E. Mermaid Lane, Philadelphia 18, Pa. A water-cooled heat exchanger is built into the system that cools pumped liquids circulating in the rotor chamber. The pump will handle oils and chemicals up to 1,000° F.

Circle T-21 on Reader-Service Card

Seam-Free Hosiery Machine

The Fidelity 400 machine, built by Fidelity Machine Co., Inc., 3908-18 Frankford Ave., Philadelphia, Pa., can now be changed from plain to mesh or stretch fabric in a few minutes.

The machine is electronically controlled, and the change-over is done by an integral part of the machine.

Circle T-22 on Reader-Service Card

Batteries Recharge Fast

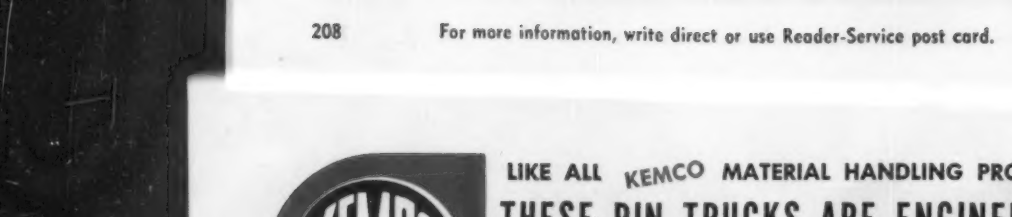
A battery charger to recharge batteries for fork trucks has been announced by Motor Generator Corp., Troy, Ohio. To use the charger, you connect the charging plug into the receptacle on the battery and set the pointer on the charge control unit to the normal-charge position Then the battery will be charged in about 3 to 3½ hrs.

Circle T-23 on Reader-Service Card

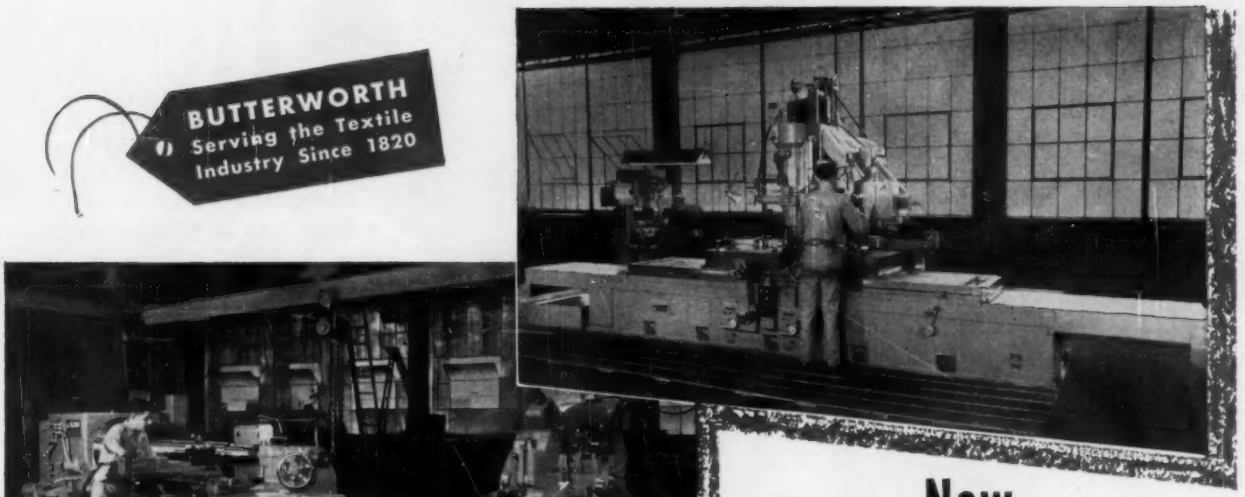
Heavy-Duty Casters

Heavy-duty casters with replaceable rubber tires, semisteel wheels, and

HAE-OG163-1055



plastic wheels are being made by Will-



New Machines to Save Money for You

We've spent $600,000 in the past 2 years . . . to save you money on famous Butterworth finishing machinery.

The new machine tools on this page are a part of that program. For you, they mean Butterworth high quality at a new low cost. That's because they have increased our productive capacity . . . lowered our labor costs . . . and made it easier to maintain the always-high Butterworth standard.

When did you last price that Butterworth machine you need? Call in the Butterworth engineer today. You may get a pleasant surprise.

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Bethayres, Pennsylvania
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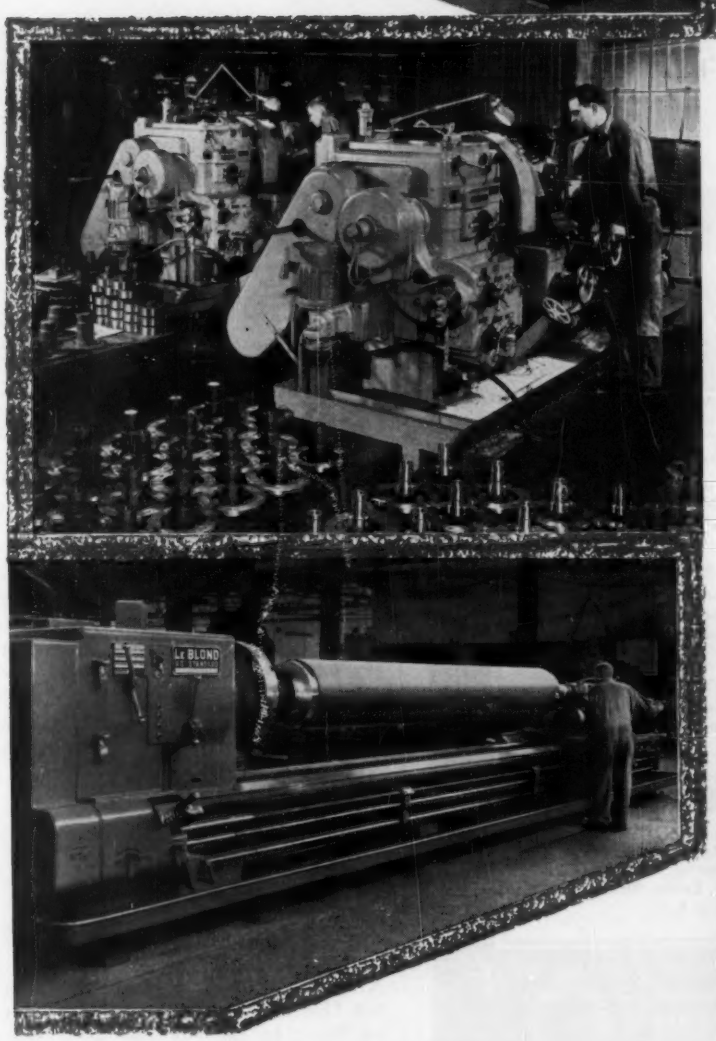
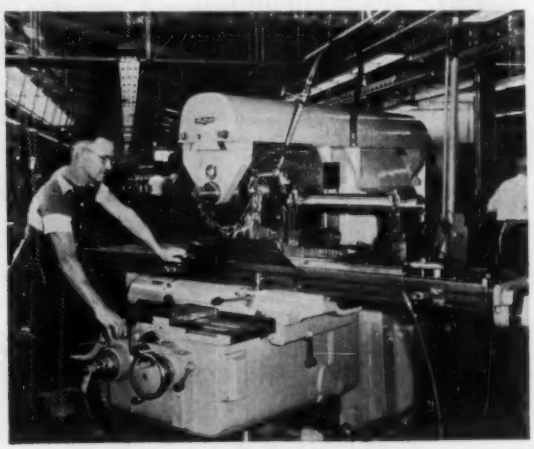
Representatives in Principal Cities of the World
Machines for Bleaching, Boiling-Out, Dyeing, Mercerizing, Finishing & Embossing : : Pot Spinning Machines for Synthetic Fibers : : Calender Rolls : : Tenter Chains





HAE-OG163-1055

Cuts Production Cost
on Mens', Womens' Sweaters

● High-speed, trouble-free operation assured by simplicity of design, sound engineering, precision unit-construction of all sub-assemblies. Wide operating range, new refinements, increase production up to 20%
● Versatile! Handles synthetics, worsteds, zephyr, cashmere yarns, etc. Stitch construction includes interlock, rib, jersey which can be incorporated with tuck and welt stitches and (on interlock fabric) fancy stitches embodying stripes, colored checks, blister, grenadine; also pleat effects and jersey interlock. Our big backlog of orders proves preference for OGA and OTA equipment—makes it necessary to place your orders several months ahead of wanted delivery date! Write at once!

ORDNANCE GAUGE CO. • PHILADELPHIA 25, PA.
EXCLUSIVE SALES REPRESENTATIVE
MAC M. ROTHKOPF 317 BUSHWICK AVE. BROOKLYN, N. Y.

OGA
OTA
CIRCULAR FULLY AUTOMATIC KNITTING MACHINES

NON-FLUID OIL
TRADE MARK REGISTERED

IS ON THE BALL!

NON-FLUID OIL protects ball and roller bearing surfaces from friction *and* moisture by forming a perfect lubrication seal on bearing surfaces and also between rotating shafts and housing.

Year after year, more textile mills depend on dependable NON-FLUID OIL because it "stays alive" longer than ordinary greases and keeps bearings at peak performance—at lowest maintenance cost.

There is a special grade of NON-FLUID OIL for every type of ball or roller bearing. Send for Bulletin 506 and free testing sample of NON-FLUID OIL, stating size, speed, and type of bearing and machine.

NEW YORK & NEW JERSEY LUBRICANT COMPANY
292 Madison Ave., New York 17, N. Y. Works: Newark, N. J.
SOUTHERN DISTRICT MANAGER: Lewis W. Thomason, Jr., Charlotte, N. C.
WAREHOUSES: Birmingham, Ala., Greenville, S. C., Atlanta, Ga., Chicago, Ill., Columbus, Ga., Springfield, Mass., Charlotte, N. C., Detroit, Mich., Greensboro, N. C., St. Louis, Mo., Providence, R. I.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture. So-called grease imitations of NON-FLUID OIL often prove dangerous and costly to use.

plastic wheels are being made by Will-Mat Corp., 2511 Wilkinson Blvd., Charlotte 8, N. C. All wheels are made in 6- and 8-in. dias. and have ring- and thrust-type ball bearings. The swivel fork is a heavy-gauge one-piece stamping with a double-ball race for long life and easy swiveling action.

Circle T-24 on Reader-Service Card

Electric Impact Wrench

Workers can use an electric impact wrench with only one hand. The tool is made by Thor Power Tool Co., 175 N. State St., Aurora, Ill. It has a reversing button in the handle to permit the operator to reverse the tool with his thumb. The tool is designed for driving and removing nuts, bolts, and other threaded fasteners. But the wrench may also be used for drilling, reaming, tapping, stud-setting, driving screws, and sanding.

Circle T-25 on Reader-Service Card

Two Homogenizer Models

Manton-Gaulin Mfg. Co., Everett, Mass., has announced two new additions to its line of homogenizers. The homogenizers are K6-X, with capacities from 300 to 1,000 gals. per hr.; and K12-X, with capacities from 500 to 2,000 gals. per hr. The two models have drive improvements to provide increased capacity.

Circle T-26 on Reader-Service Card

Ball-Bearing Burr

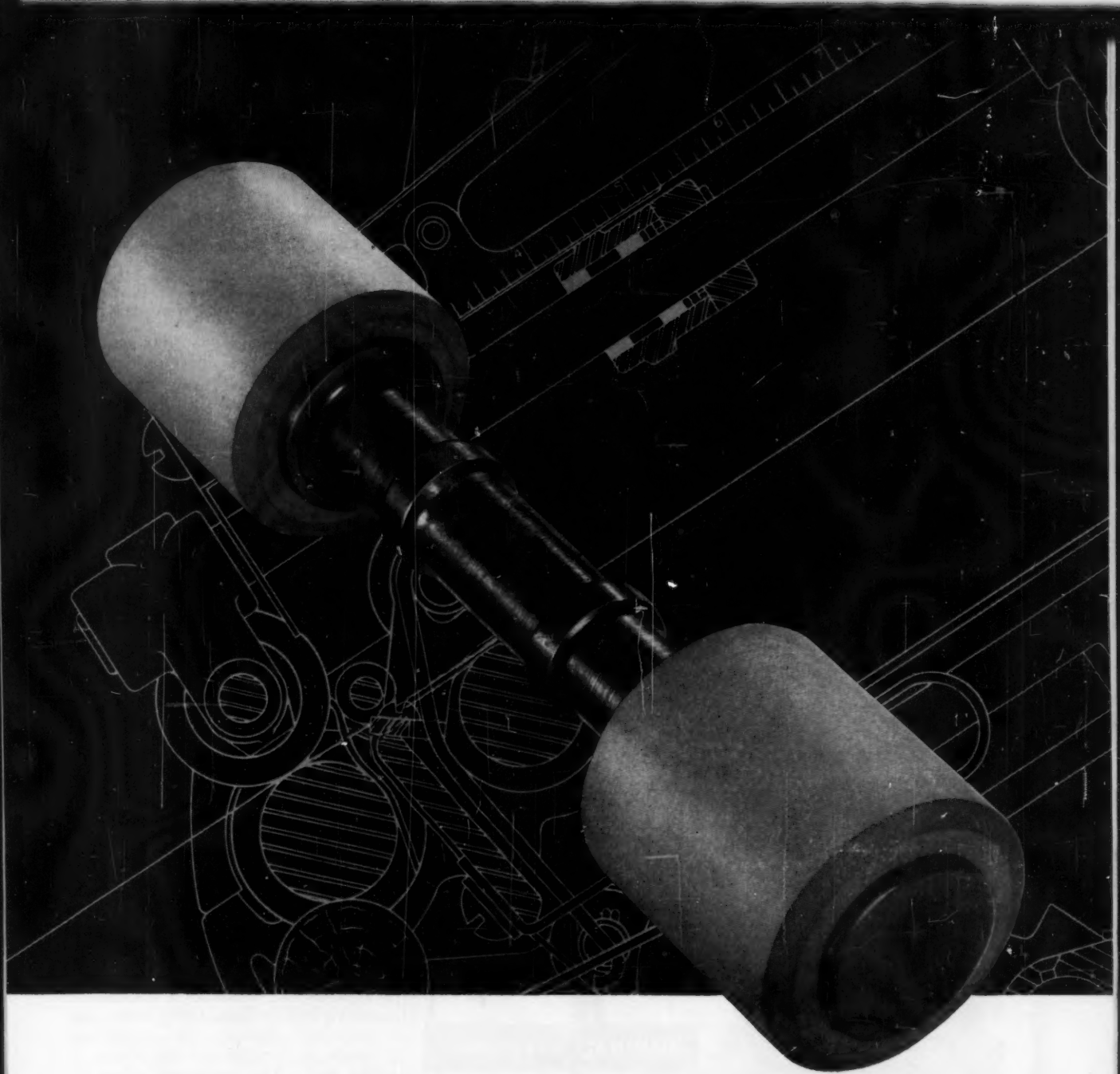
Precision Knitting Machine Co., Syracuse, N. Y., is offering a ball-bearing burr for spring-needle knitting machines. Cast-off, lander, clearing, and combination burrs that require no lubrication are available.

The new burrs reduce oil stains on the fabric and eliminate the need for oiling inside equipment.

Circle T-27 on Reader-Service Card

Hosiery Needle Oil

A needle oil to overcome the difficulties of high-speed fine-gauge knitting operations has been announced by Shell Oil Co., 50 W. 50th St., New York 20, N. Y. Called Vexilla Oil 117, the new product includes an inhibitor to prevent rust formation



How to get stronger, more uniform yarn— on any worsted equipment

One of the best ways to get stronger worsted yarn is always to use Armstrong J-490 Accotex® Roll Covers. These covers give you top-quality yarn and maximum lap resistance, whether you're spinning natural or synthetic fibers, or whether you have Bradford, French, or modified cotton equipment.

Reason why: J-490 Covers are made of a unique synthetic rubber compound that contains electrolytes. These electrolytes help the cover *repel* broken ends—eliminating the basic cause of front roll lapping. The J-490 Cover is specially made to provide a smooth drafting surface. This is another reason why it turns out clean, uniform worsted yarn.

This is an especially long-wearing cover. It'll give you years of top-spinning performance with only an occasional re-buffing. Set up a test side of J-490 Accotex Covers soon. Your Armstrong representative will be glad to help.

For the booklet, "Armstrong Textile Roll Coverings and Mill Supplies," write Armstrong Cork Company, Industrial Division, 6812 Dauphin St., Lancaster, Pennsylvania.

Armstrong ACCOTEX WORSTED COVERS

. . . used wherever performance counts

MACHINES FOR YARNS • TWINES • CORDS • ROPES

SPECIALIZED EXPERIENCE
TWISTING • STRANDING
FORMING • LAYING
COTTON • JUTE • MANILA • SISAL
NYLON • DACRON • ORLON • SARAN
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HASKELL-DAWES MACHINE COMPANY

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HASKELL-DAWES MACHINE COMPANY
2231 E. ONTARIO STREET, PHILADELPHIA 34, PENNA.

DURANT DOFFMETER

Model 3-DM
Alaska Gray and
Seal Brown finish

ELIMINATE OVERRUNS

Warns operator or stops machine when run is completed. Yes — eliminates annoying underruns, too!

UNIFORM LENGTHS

Easy, accurate way to assure uniformity in lengths of cloth or yarn.

MAXIMUM PRODUCTION

A Durant Doffmeter takes the responsibility — operator can do other work.

Specifically Designed
for LOOM APPLICATIONS

The Durant Doffmeter is a compact, predetermined counter designed to cut off the loom or signal when the preset number of yards is reached. Eliminates cut marks and waste ends by assuring uniform yardage . . . simplifies inventory control.
Present day high costs make the installation of Durant Doffmeters on every loom a practical money saving investment. Plan now . . . write or contact us for detailed information.

DURANT MANUFACTURING CO.
1931 N. Buffum St., Milwaukee 1, Wis.
131 S. Water St., Providence 3, R. I.

Representatives in Principal Cities

Send for Catalog No. 501

PRODUCTIMETERS
SINCE 1879 Count Everything

for several days whether the machine is idle or not.

The oil is suited for knitting sized nylon; and it eliminates oxidation, gum formation, and cooper-soap deposits. The oil is easily scoured out of gray hosiery.

Circle T-28 on Reader-Service Card

Transfer-Applying Machine

The Ashe transfer-applying machine will apply up to 1,500 doz. transfers per 8-hr. shift. Designed especially for hosiery plants, the machine can apply one, two, or three transfers simultaneously to one stocking. The machine is distributed by Jarrell Bullard Co., P. O. Box 2154, Charlotte, N. C.

Circle T-29 on Reader-Service Card

Fluorescence-Microscopy Light Source

A very intense light source for fluorescence microscopy has been announced by William J. Hacker & Co., New York, N. Y. The light is in the form of a 200-w. high-pressure mercury-vapor arc lamp, which can be quickly interchanged when used with the company's Fluorex equipment. The equipment can be used with all makes of microscopes.

Circle T-30 on Reader-Service Card

Microscope, Viewing Screen

The Micro-Viewscope, announced by William J. Hacker & Co., New York, N. Y., combines a microscope with a built-in illuminating screen and projection elements that render an image on the 8-in. viewing screen of the unit. The instrument offers relief from eye-strain by eliminating intense, motionless observation through eyepieces.

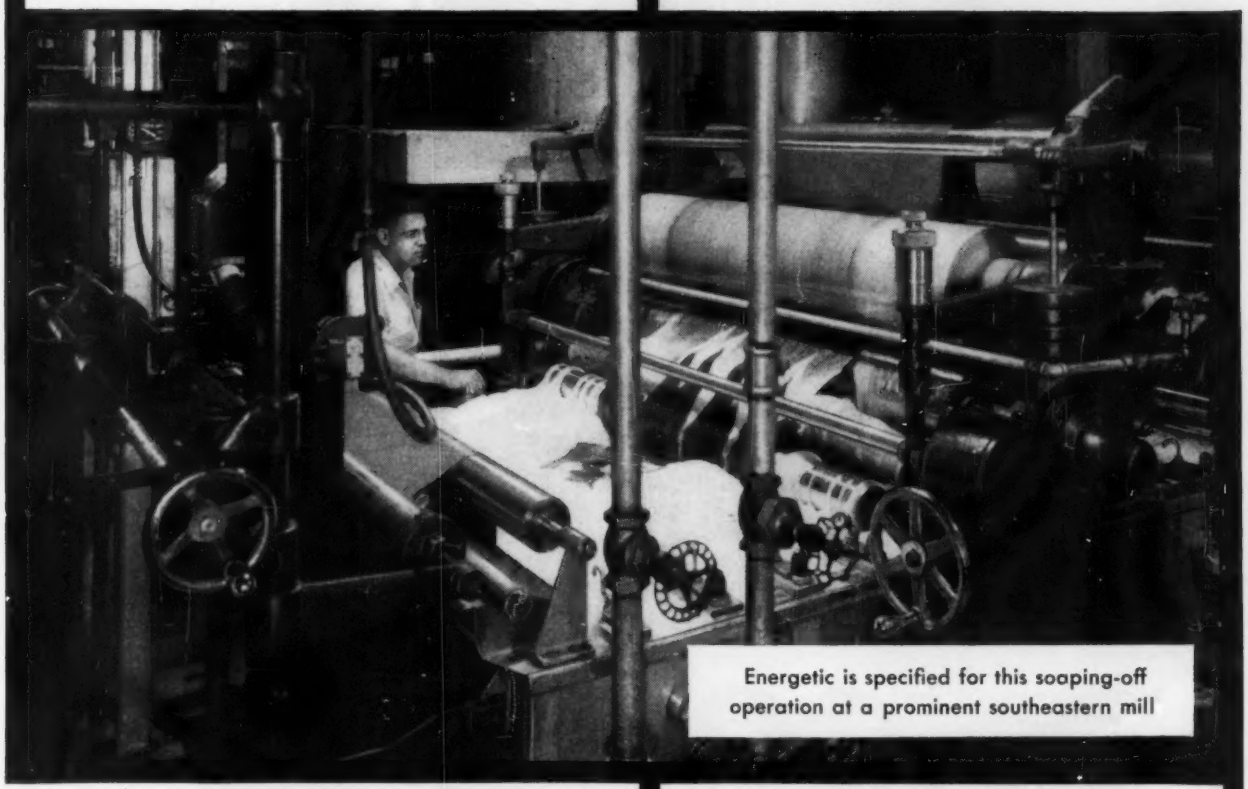
Circle T-31 on Reader-Service Card

Cone-and-Plate Viscometer

Ferranti Electric, Inc., New York, N. Y. has announced the Ferranti-Shirley viscometer, an instrument designed to measure the flow properties of most types of fluids. Based on the cone-and-plate principle, the viscometer is useful for the most advanced investigations and for large numbers of routine viscosity measurements. The instrument consists of a stationary flat plate and a slightly conical rotating disk driven by a variable-speed

Armour Energetic® pays off where you soap-off . . .

with sharper, clearer prints!



Energetic is specified for this soaping-off operation at a prominent southeastern mill

Soap-off with powerful Energetic and watch the prints roll out! They'll be extra sharp and clear with clean, bright grounds — just the kind buyers want. Use Energetic for maximum detergency and economy in bleaching and dyeing processes, too. The manager of one the nation's largest mills reports that Energetic is the *only* synthetic which could solve his crocking problem on naphthol-dyed yarn.

A powerful, concentrated nonionic synthetic detergent, Energetic is supplied *90% active*—it takes only one pound to do the work of 3 full pounds of anionics. This adds up to a savings per job of about 21¢ with every pound of Energetic you use. Add builders to cut costs even more.

Send the coupon for test samples of Energetic. Or, for quick delivery on a 5-gallon trial drum, place an order in the coupon at right. And send for booklets on Energetic and its two companion products—Energetic S and Energetic W-100. All three save time, money and material!

Energetic—Versatile, economical and so efficient you need use only ⅓ as much as anionics for maximum detergency.

Energetic S—Designed for use with solvents—gives outstanding results in boiling off synthetic fibers, hosiery finishing and desizing cotton.

Energetic W-100—A new instant-wetting agent which speeds up wet processing all through the mill.

FREE SAMPLE AND TRIAL ORDER BLANK

Armour Industrial Soap Department
Armour and Company, 1355 W. 31st St., Chicago 9, Illinois

Please send me:

☐ FREE Sample of ENERGETIC ☐ S ☐ W-100

.....5-gallon drums of ENERGETIC, $13.86 each

☐ Free Booklet, ENERGETIC and ENERGETIC S

☐ Free Booklet, ENERGETIC W-100

☐ Bill me ☐ Check enclosed ☐ Money Order

Your money back if not completely satisfied. For refund, ship unused portion.

Name..... Title.....

Firm.....

Address.....

City..... Zone..... State.....

T12

ARMOUR *Soap Division*
INDUSTRIAL SOAP DEPARTMENT

34 STANLEY MAGIC DOOR CONTROLS

PREVENT PRODUCT DAMAGE At Avondale Mills By EQUALIZING DRAFTS and PRESSURES

Drafts or pressure conditions created by doors that remain open too long cause product damage in textile mills by upsetting specified temperature and humidity requirements. But not at the various Avondale mills where 34 Stanley Magic Door Controls are in use to open doors on approach, keep them open the minimum of time required to let traffic through, then close them automatically. Above, a Stanley Magic Eye* Control is shown in operation at the Avondale Mills' plant at Sylacauga, Alabama.

To control temperature and humidity and to . . .

- **Save time by speeding up traffic flow**
- **Eliminate maintenance costs due to damaged doors**
- **Improve working conditions**

. . . your mill, too, will benefit through the installation of Stanley Magic Door Controls to operate swinging, sliding or folding doors. Check the yellow pages of your telephone directory for the name of the Stanley Magic Door Representative nearest you. Or mail coupon for free literature and to arrange a visit from the Stanley Representative.

MAGIC EYE

(Photo-electric). Actuates door when beam is broken.

PUSH PLATES

Wall-mounted push or kick plates. Adaptable to many industrial locations.

PULL CORD

Door is operated only with pull of overhead hand cord.

*U.S. PAT. NO. 2173455

STANLEY Magic Door CONTROLS

REPRESENTATIVES IN PRINCIPAL CITIES

THE STANLEY WORKS, Magic Door Division
01D-M Lake Street, New Britain, Conn.

☐ *Please send complete information on Stanley Magic Door Controls*

☐ *Have Representative call.*

Company Name_____

My Name_____ Position_____

Company Address_____

City_____ Zone_____ State_____

STANLEY TOOLS • STANLEY HARDWARE • STANLEY ELECTRIC TOOLS • STANLEY STEEL STRAPPING • STANLEY STEEL

motor. A very small amount of the sample is sheared between the cone and the plate, and the drag on the cone is measured by a precision electro-mechanical torque dynamometer.

Circle T-32 on Reader-Service Card

Snap-Around Volt-Ammeters

Pyramid Instrument Corp., Lynbrook, N. Y., announces the addition of three high-voltage volt-ammeters to its line of Amprobe instruments. The tapered probe jaws are designed for hard-to-get-at wires in crowded switch boxes.

Circle T-33 on Reader-Service Card

Motor-Speed Control

Electric Regulator Corp., Norwalk, Conn., has announced its new line of d.c.-motor-speed controls. The compact units deliver stepless motor control from a dead stop to "above base speed." Motor speed is set by the operator and remains constant within 2% despite line and load variations.

Circle T-34 on Reader-Service Card

Tachometer

A low-cost hand tachometer that gives a continuous indication of speed has been announced by Jones Motrola Corp., Stamford, Conn. The instrument measures either rotation direction without adjustment. The principle of operation is centrifugal-mechanical; so the tachometer is unaffected by temperature, moisture, electrical currents, or magnetic conditions.

Circle T-35 on Reader-Service Card

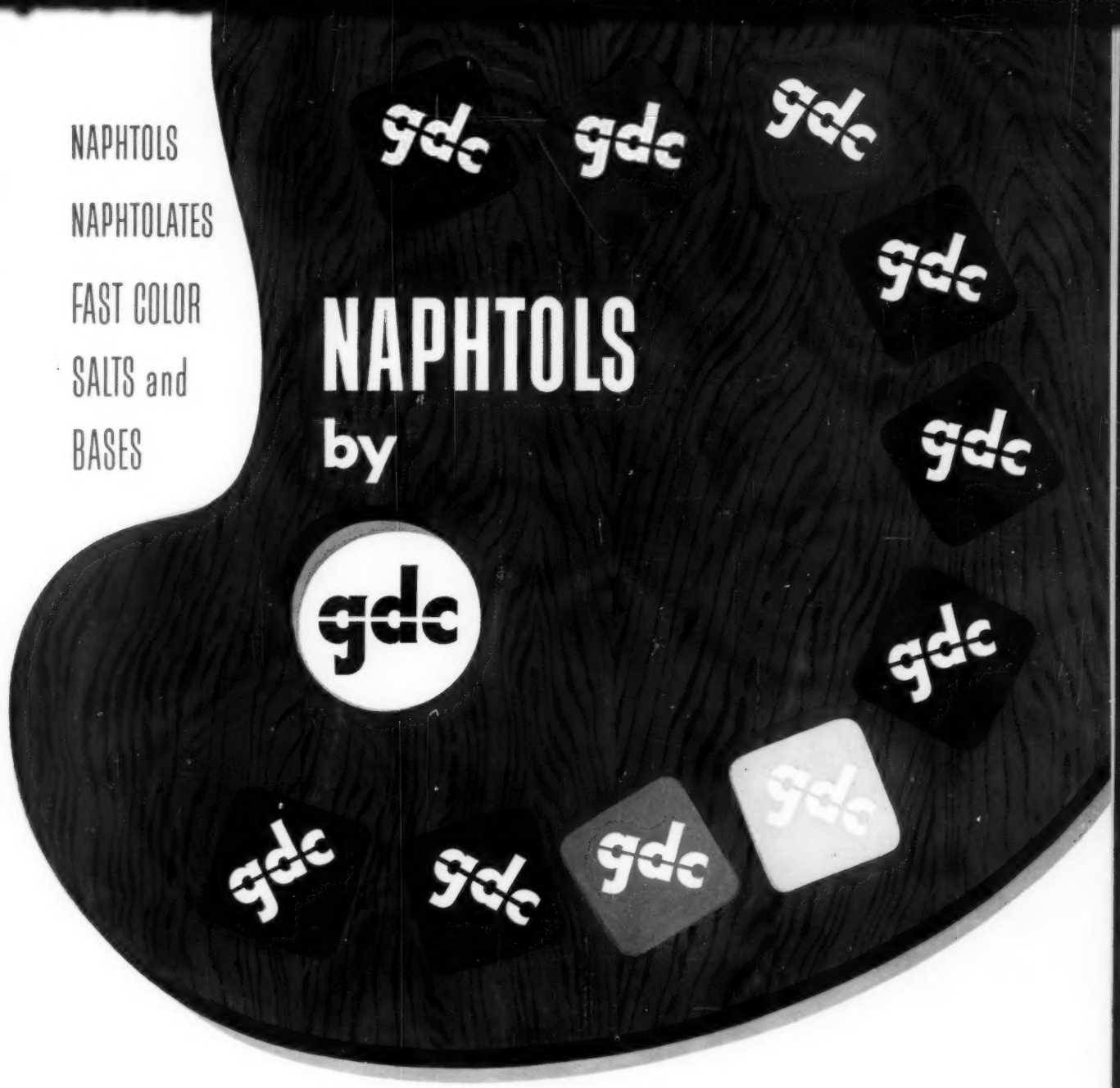
Voltage Variator

Kileen & Son Production Engineering Co., Gardena, Cal., has announced a new reactor-type voltage variator for controlling motor speeds. The unit reduces speed on shaded-pole and split-capacitor motors and reduces voltage on any other alternating-current device. It generates less heat than resistor-type voltage regulators.

Circle T-36 on Reader-Service Card

Mercury Lamps Last Longer

An improved mercury lamp that gives more light and longer life is



Colors fast to washing . . . fast to sunlight

Whatever the volume of the dyer or printer—whatever his method—GDC offers the broadest range and the right combination of products to create the whole spectrum of fashion-right shades. These range from bright yellows and reds to rich deep wines, navies and browns. They are dependable allies in meeting today's ever-increasing demand for fast colors.

Years of manufacturing experience and extensive technical resources are continually at work for you—breeding new refinements into our products—creating new benefits to you. The Naphtols, Fast Color Salts and Bases are *now non-dusting* powders. Most of them offer greater ease of solubility and better stability in dyeing and printing, as well as in storage. These are all plus factors. For those who prefer to work with a prepared naphtol solution, we offer liquid Naphtolates.

Supporting every product we offer are the facilities—available to you—of our Technical Service Laboratories. We invite the opportunity to discuss the relative values of Naphtols and Naphtolates, Fast Color Salts and Bases—in terms of your particular requirements.

From Research to Reality

gdc gaf

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A SALES DIVISION OF GENERAL ANILINE & FILM CORPORATION

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announced by General Electric Co.,

HAYES INDUSTRIES, INC.

The World's Largest Producer of Light Metal Beams

JACKSON, MICHIGAN

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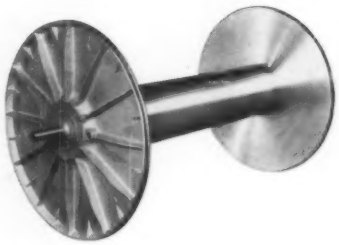
R. E. L. Holt, Jr. & Assoc.
Greensboro, N. C.

EASTERN REPRESENTATIVE:
J. Paul Laird
Philadelphia, Pa.

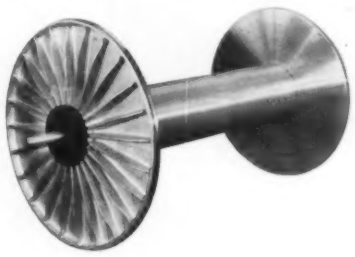
NEW ENGLAND REPRESENTATIVE:
J. S. Fallow & Co.
New Bedford, Mass.

CANADIAN REPRESENTATIVE:
J. S. Fallow & Co.
Montreal, Canada

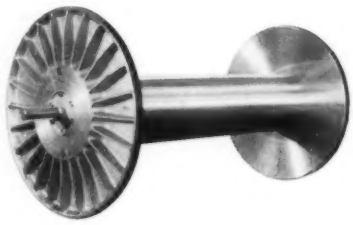
HAYES LIGHT METAL BEAMS cut costs in modern textile production, and help toward *higher profits* due to true running, perfect balance, elimination of snagging or catching with the highly polished finish of inside head faces, rust-proof construction, low maintenance costs, and fewer fabric rejects. Illustrated are only a few of HAYES LIGHT METAL BEAMS for standard production purposes. Our skilled engineering staff can help you. *Write, phone, or wire us your problem today.*



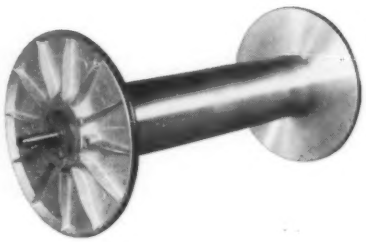
HAYES 38" x 54½" Aluminum Section Beam for cotton and spuns. Lightweight 207 lbs. Capacity, net weight of yarn 1,050 lbs.



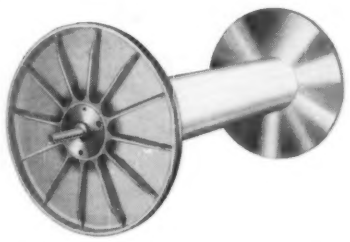
HAYES 36" x 54½" Heavy Duty Aluminum Section Beam for acetate, spuns, and cotton. Can be adapted to all standard warpers.



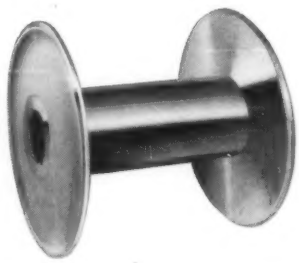
HAYES Heavy Duty Section Beam for nylon. Can be furnished in 30" and 32" diameter heads. Barrel diameter 11¾". ½" minimum wall.



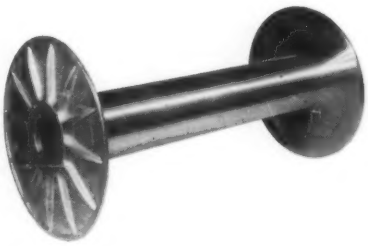
HAYES Bolted Type Section Beam for acetate. 30" x 54¼". 11¾" diameter barrel. Can be adapted to all standard warpers.



HAYES Aluminum Section Beam for acetate. Screwed type. Head sizes 26", 28", 30", 32". 54¼" traverse. 11¾" diameter barrel. Can be adapted to all standard warpers.

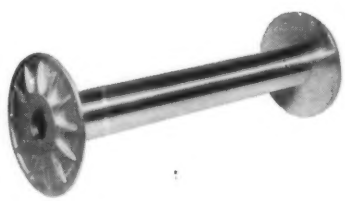


HAYES 21" Aluminum TRICOT Beam for nylon. Barrel size 7¾" diameter. Head thickness 1". Furnished in ⅜" and ½" wall. Bored for 4½" shaft. Keyways 9/16".



HAYES 21" Aluminum TRICOT Beam for acetate. Barrel 7⅜". Head thickness 1". Any desired traverse. Bored for 4½" shaft. Keyways 9/16".

HAYES 21" Heavy Duty Forged Head Aluminum TRICOT Beam for nylon. Head thickness 1¼". Barrel 7¾". ½" wall. 39-7/16" traverse. Bored for 4½" shaft. Keyways 9/16".



HAYES 13¾" diameter Aluminum TRICOT Beam for acetate. Barrel size 4.925" diameter. Made in head thicknesses of 39/64" and 1". Traverse dimensions to suit. Bored for 2¾" shaft. Keyways 9/16".

HAYES manufactures a variety of Aluminum Loom Beams to fit Draper, and Crompton & Knowles looms, for acetates, spuns, and nylon. These can be manufactured with fixed or adjustable heads in sizes from 22" to 32" diameters.

Co., 13946-168 Kercheval Ave., Detroit, Mich. The indicator is de-

announced by General Electric Co., Nela Park, Cleveland 12, Ohio.

Four designs in 400-w. lamps have these advantages: (1) they produce 5 to 12% more light at initial installations, (2) maintenance is easier, (3) they last longer, (4) and they are more uniform. The four designs are H400-El, H400-Jl, H400-Rl, and H400-RCl.

Circle T-37 on Reader-Service Card

Valve Couplings

C. B. Hunt & Son, Inc., Salem, Ohio, has announced a locking, safety-type, quickly detachable valve coupling that permits the operator to shut off air and change tools quickly and safely. The couplings are adapted for air lines up to 250 psi.

Circle T-38 on Reader-Service Card

Temperature Detector

Small platinum resistance temperature detectors with high-speed response have been announced by Robertshaw-Fulton Controls Co., Philadelphia, Pa. Useful for precision temperature measuring and control, the detectors can be applied to temperature ranges from 330 to 1,380° F.

Circle T-39 on Reader-Service Card

Tank for Floor Mopping

A two-compartment tank for mopping floors is only 26 ins. high. Each compartment of the tank holds 15 gals. of liquid cleaner; one compartment is equipped with a mop wringer. The manufacturer is S. C. Lawlor & Co., 124 N. Aberdeen St., Chicago 7, Ill.

Circle T-40 on Reader-Service Card

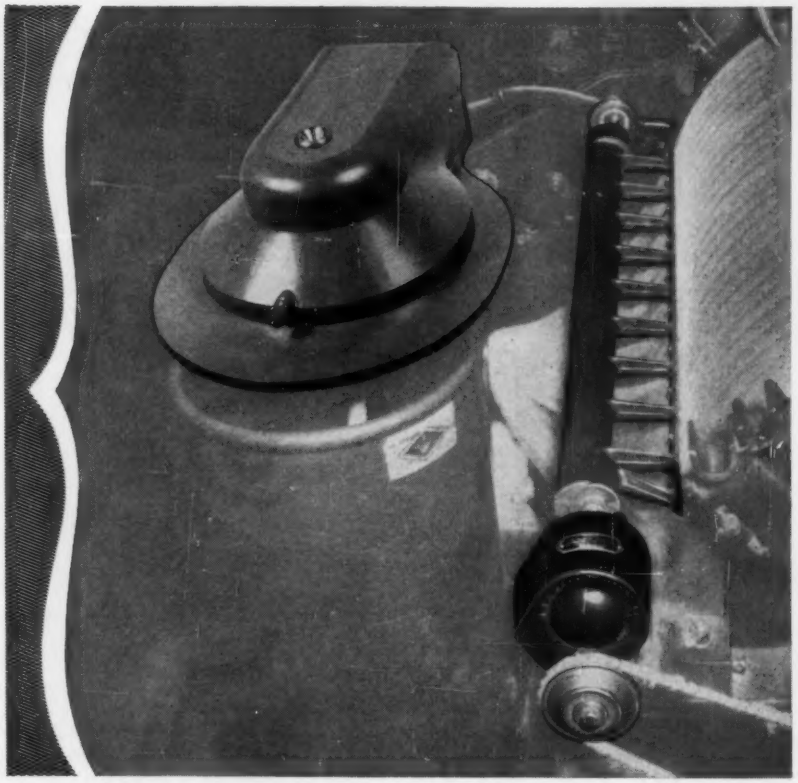
Air Without Drafts

Drafts are prevented in office and factory air-conditioning systems with an air diffuser developed by Multi-Vent Div., Pyle-National Co., 1334 N. Kostner Ave., Chicago 51, Ill. The diffusers can also be used with ventilating and heating systems. They are mounted in the ceiling and cost as low as $5.75 each.

Circle T-41 on Reader-Service Card

Bin-Level Indicator

A device that indicates the level of materials contained in bins or chute has been announced by Bin-Decator



SOUTHERN STATES NOW OFFERS
A FOUR-WAY COMBINATION
TO BETTER CARDING OPERATIONS

No mill need put up with hot, leaky, rattling comb boxes, hard-to-align comb blades with distorted fingers, out-dated off end bearings, or antiquated coilers with small cans. Not when Southern States has a four-way answer to all of those problems and at prices every mill can afford!

One. Ball-bearing, sealed-for-life Comb Boxes that operate smoothly, quietly and never run hot.

Two. New Aluminum Comb Stock with solid blade support. Light in weight, yet more rugged than conventional steel. End journals of steel simplify balancing and assure long life. True alignment is easy. No distortion between fingers.

Three. Vibrationless Off End Stand. Pre-lubricated sealed bearing eliminates oiling. Mounts either right or left hand.

Four. Universal Coiler Head for 14- or 15-inch cans for use on any make coiler. Simplified design. Cut tooth gears and oilite bearings throughout.

These Southern States units will bring vastly improved carding operations to your mill and cut operating costs. Facts and figures, based on case histories, will prove how they pay for themselves in record-short time. Let our representative give you the details, or write us direct.

SS® SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

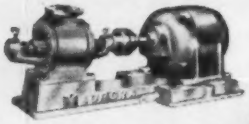
For more information, write direct or use Reader-Service post card.

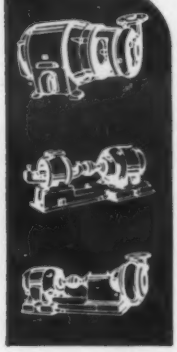
22" to 32" diameters.

"TOPS" by EVERY TEST

Capacities to 150 G.P.M.

Heads to 600 Ft.





APCO Two Stage Pump for High Pressure Service

APCO is the highest development of the Turbine-Type Pump. Unsurpassed for small capacity high head duties. Handles non-lubricating liquids almost indefinitely without wear. Suited to "1001" duties. Write for Bulletin 111 or Condensed Catalog "M".

STAINLESS STEEL APCO PUMPS

We carry representative sizes of APCO's in stock in No. 316 Stainless Steel for prompt shipment.

Write for CATALOG "M"

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AURORA® PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
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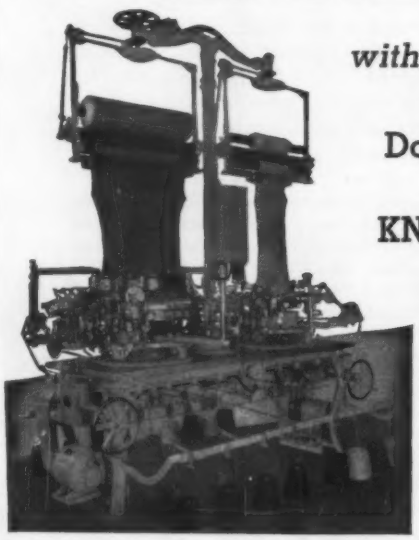
BIG WEEKLY SAVING PER OPERATOR



with installation of NEW
TOMPKINS D-2
Double Head Spring Needle
KNITTING MACHINE

New stop motions and furnishing wheels provide the profitable answer to reducing cloth imperfections and needle breakage—imperfections are caught before they get into the cloth! Actual installations are showing remarkable savings in knitting various types of material. SOME MILLS CLAIM THEY HAVE CUT PRODUCTION COSTS IN HALF . . . OTHERS REPORT SAVINGS UP TO $600.00 PER WEEK PER OPERATOR, over old machines. All this PLUS AN IMPROVEMENT IN FABRIC QUALITY!

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BEEF BAG KNITTER | HOCKEY CAP KNITTER | MULTIPLE FEED KNITTER

TOMPKINS BROS. CO. • Syracuse 4, N. Y.

Co., 13946-168 Kercheval Ave., Detroit, Mich. The indicator is designed to work under vacuum or pressure, and to work with either small- or large-lump material. A paddle rotates slowly in the bin when materials are below the level of the paddle blades. When material partially or entirely covers the blades, the torque exerted by the motor actuates a Micro switch that stops the motor. Motion of the paddle is resumed when material falls below blade level again.

Circle T-42 on Reader-Service Card

Plastic Protects Rope

A plastic material in spray cans increases the life of nylon, hemp, and other ropes used as friction devices on pulleys or flanges. Ropes on slasher section beams are said to run 25% longer without fraying when they're sprayed with the material. The plastic, which can be applied to ropes at only a fraction of a cent per yard, is made by Krylon, Inc., 317 S. 16th St., Philadelphia 2, Pa.

Circle T-43 on Reader-Service Card

Machine Mounting

Machine mountings containing steel springs to reduce machine vibration are made by T. R. Finn & Co., Inc., Industrial Div., Hawthorne, N. J. The mounting housing is cast semi-steel and contains rubber thrust bumpers and nylon dampers in addition to the steel springs. A bolt secures the mounting to the machine and also levels the machine.

Circle T-44 on Reader-Service Card

Glass Blocks

Glass blocks recently introduced by Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa., are now available in an 8-in. size in addition to the previously announced 12-in. size. The block incorporates a pale-green fibrous glass diffusing screen that reduces the intensity of glare and heat.

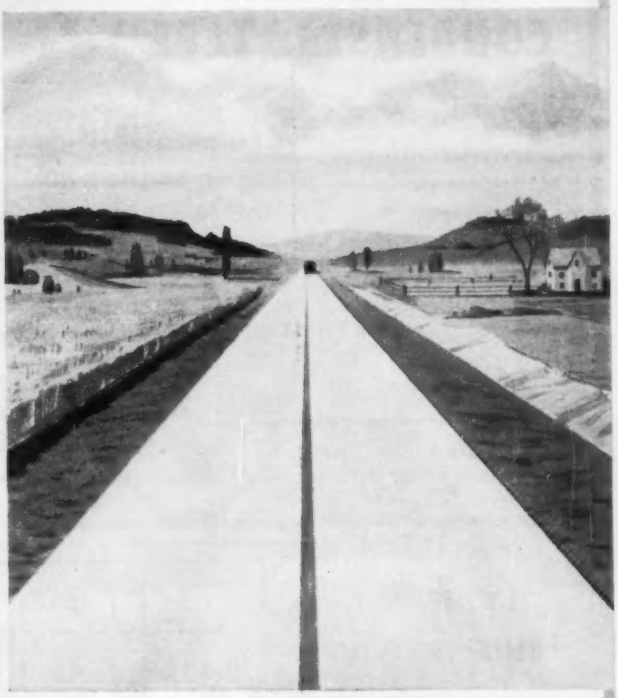
Circle T-45 on Reader-Service Card

Intercommunication System

An intercommunication system that provides private conversations between stations without controls at either station during the conversation has been introduced by Talk-A-Phone Co., 1512

DOW

...almost out of sight already...



YOUR CAUSTIC ORDER'S ON ITS WAY FROM DOW

The steel rails could be in New York or New Mexico . . . the highway in Oregon or Alabama. Wherever, however . . . it's another caustic soda order on the way from Dow. The order is just hours old, but it's on its way.

Dow's vast and amazingly flexible distribution network is the answer. Three plants and six shipping terminals are tied together by a network of order communications.

Hundreds of caustic customers have learned how resourceful and helpful Dow Technical Service men can be. Whether it's an irritating wrinkle in your processing or a basic decision about the form of caustic you can use to best advantage—a call to Dow brings these trained consultants to you. Surprising savings in plant operations often develop from their visits.

Put your caustic problems "out of sight" for good. Simply make sure your next caustic order is with Dow. THE DOW CHEMICAL COMPANY, Dept. AL 390E-1, Midland, Michigan.

you can depend on DOW CHEMICALS DOW

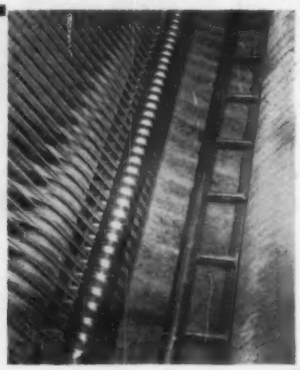
BENJAMIN BOOTH COMPANY, the originators of STRIP-O-MATIC card clothing, manufacturers of a complete line of quality card clothing

ANNOUNCE

SUPR-O-TAPE

THE PROVEN FABRIC

CONDENSER TAPE



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- LONG LIFE
- NO STRETCH
- HIGH STRENGTH
- NO SURFACE CRACKING
- NEEDS NO OIL
- HOLDS SQUARE EDGES INDEFINITELY
- CAN BE MADE ENDLESS IN ANY LENGTH
- LOW IN COST

Write the Benjamin Booth Company today for full details and prices.

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ALLEGHENY & JANNEY STS., PHILA., PA.

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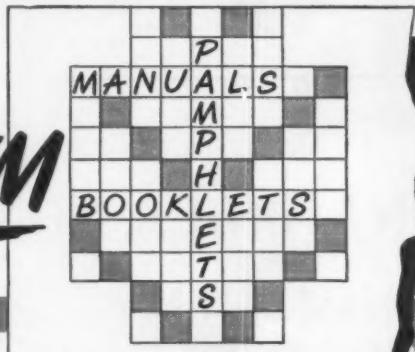
IF

THIS IS YOUR

PROBLEM



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This service is available through ad agencies.

S. Pulaski Rd., Chicago, Ill. The Super Chief model permits private conferences between as many as four stations without interference from any other station.

Circle T-46 on Reader-Service Card

Printer for Conveyor

Markoprinter, a machine for printing cartons, is made by Adolph Gottscho, Inc., Hillside 5, N. J. One or more machines are attached to a conveyor, and packages are marked as they move along the conveyor. The machine marks codes, dates, varieties, sizes, colors, lot numbers, and your own tradename. All the marking is done automatically.

Circle T-47 on Reader-Service Card

Drawing Cans

Three models of 18-in. fibre drawing cans have been developed by National Vulcanized Fibre Co., Box 311, Wilmington 99, Del. One model has an insert metal rim; one has a turned fibre top; and the other has a regular metal top. The cans are 36 or 42 ins. tall.

Circle T-48 on Reader-Service Card

Strapping Machine

A power strapping machine for rapid strapping of production-line packages is being manufactured by Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill. The features include: (1) uniformly strapped packages, (2) selected strap tension, (3) it fits into existing conveyor lines and permits setting up a centralized flow of materials, and (4) no operator fatigue and the resulting loss in packaging time, since the machine does all the work.

Circle T-49 on Reader-Service Card

Exhaust Purifier

A catalytic process is used to remove harmful fumes from leaded gasoline in the Oxy-Muffler, produced by Oxy-Catalyst, Inc., Wayne, Pa. Particularly suited for gasoline-powered trucks operated in enclosed areas, the muffler removes up to 90% of the carbon monoxide and other fumes produced by the motor. The basic principle of the muffler is a bed of catalyst pellets through which exhaust gas is conducted. Combustion is effected by

fresh air drawn in by a venturi tube;

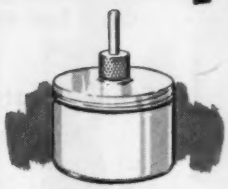
You name it-MOYNO® pumps it!

Foods

Potato salad, chow mein, peas, cream-style corn, tomatoes, molasses, chocolate.

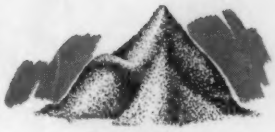
Chemicals

Caustics, acids, dyes, petroleum solvents, soaps, sludges, latex, synthetic resins.



Pastes

Paper coating, starch, seam paste, size, adhesive dope, heavy grease, graphite sludge.



Abrasives

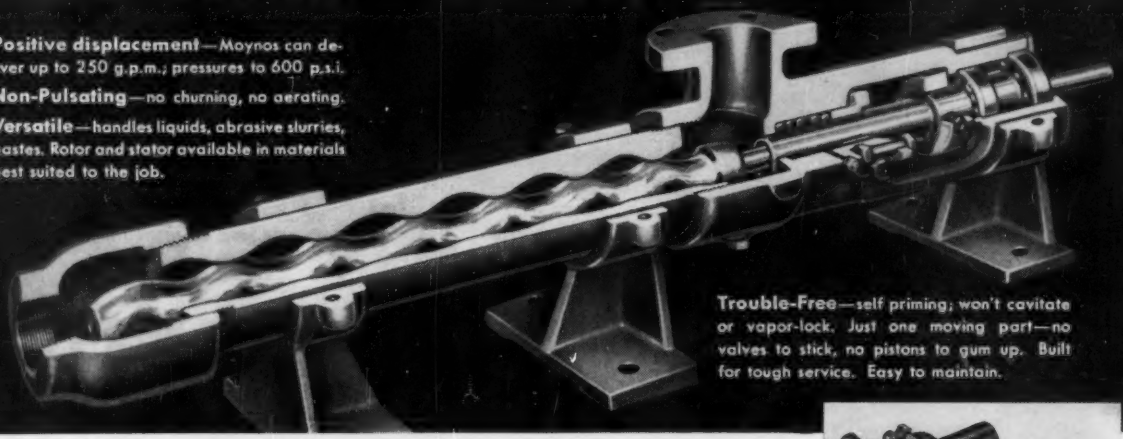
Insulator clay, frit, ground glass and water, porcelain glaze and enamel, cement, plaster.

FEATURES OF THE MOYNO THAT MAY SOLVE YOUR MATERIALS-HANDLING PROBLEM

Positive displacement—Moynos can deliver up to 250 g.p.m.; pressures to 600 p.s.i.

Non-Pulsating—no churning, no aerating.

Versatile—handles liquids, abrasive slurries, pastes. Rotor and stator available in materials best suited to the job.



Trouble-Free—self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain.

R & M Moynos handle almost anything that can pass through a pipe

The Moyno is a problem-solving pump. And whether your problem is one of materials, maintenance or flow, there's a better-than-even chance that the Moyno is the pump you're looking for.

Here is a completely different kind of pump that handles almost anything that will push through a pipe, from free-flowing liquids to non-pourable pastes—even materials containing relatively large particles or abrasives.

This is how the Moyno works: a screw-like rotor turning within a double-threaded stator creates cavities which *progress* toward the discharge end of the pump, carrying the material being handled. The result is a smooth, steady flow, free from pulsation and turbulence.

The pumping elements of the Moyno are available in a wide range of materials, depending upon the substances to be pumped. From stainless steels and synthetic rubber to tool steels, bronze, plastics—there is a Moyno that will do the job you want, and do it with remarkable efficiency.

Industrial-type Moynos are available with capacities to 250 g.p.m.; pressures to 600 p.s.i. Small Moynos (see inset), used as original equipment, serve on washers, water pumps, sprayers, and many other products.

FREE...

this informative bulletin

Tell us your pumping problem—let's see how the Moyno can help solve it. If necessary, we'll be glad to run tests for you in our own laboratories. In any case, get the details on the Moyno—mail the coupon below.

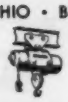
R&M®

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO • BRANTFORD, ONTARIO

Fractional and Integral HP Motors

Desk, Window, and Household Fans



Hoists and Cranes

Moyno Pumps

Propellair Industrial Ventilating Equipment

Robbins & Myers, Inc.
Pump Division, Springfield, Ohio (TW)

Please send Bulletin 30C on Moyno Pumps

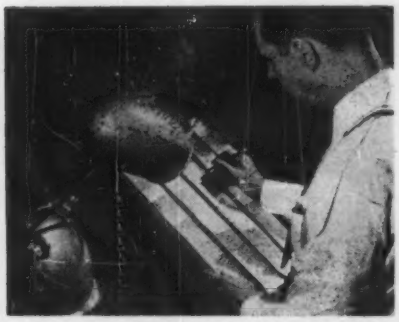
*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

For more information, write direct or use Reader-Service post card.



Magical Black Light Ends Color Matching Rejects!

Here at last is a method that takes the guesswork out of color matching —and eliminates rejects. Under Blak-Ray light, even the slightest variations in color tones are visible. Result: yarn and fabric manufacturers—spinners, weavers, knitters, finishers, bleachers, printers and throwsters — are fast adopting the black light system.

Full details are given in new Case History #111X, available free from the **BLACK LIGHT CORPORATION OF AMERICA,** Distributors for Ultra-Violet Products, Inc. **Denver:** 1334 Speer Blvd.; **Houston:** 4616 S. Main St.; **Los Angeles:** 5403 Santa Monica Blvd.; **New York:** 33-00 Northern Blvd. (L. I.); **San Francisco:** 935 Harrison St.; **Seattle:** 104 Prefontaine Pl. Main Plant: San Gabriel, Calif.

"Smiles are in Style

again in our plant!"

"Everyone, from the plant foreman to the boss is wearing a big grin since we started using Lazenby Filling Winders. We find that we get the most from our operation now. Lazenby winders have proved most economical to use.

Send Lazenby a small supply of your yarn and let them test wind and return with their report and catalog. I'm sure it will prove beneficial to your operation."

F. A. LAZENBY CO.
3106 ELM AVE.
Baltimore 11, Maryland

fresh air drawn in by a venturi tube; and the resulting product is mainly carbon dioxide and water vapor. One pellet charge is active for at least 600 hrs.

Circle T-50 on Reader-Service Card

Stencil-Cutting Machine

An electric stencil-cutting machine that operates on an electric-current cost of only 2¢ per hr. is made by Marsh Stencil Machine Co., Belleville, Ill. Power is supplied by a ⅛-hp. motor, and the machine is plugged into a light socket. To cut stencils, you just press the indicator with your finger tips.

Circle T-51 on Reader-Service Card

Electric Hoist

A heavy-duty version of a small electric hoist, Lodestar, has been announced by Columbus-McKinnon Chain Corp., Fremont Ave., Tonawanda, N. Y. The hoist has a built-in safety device that prevents the mechanism from moving when it's overloaded. It is built in ½- to 1-ton capacity. The ¼-ton model weighs only 51 lbs. The device is equipped with lifetime sealed-in lubrication.

Circle T-52 on Reader-Service Card

Cuff and Flap Presser

A cuff-and flap-forming and pressing machine has recently been patented by American Safety Table Co., 224 Fifth Ave., New York, N. Y. A dual unit permits forming and pressing a cuff or flap on one die while the other is being loaded. All types and sizes of cuffs and flaps can be formed and pressed by the machine on all types of wearing apparel.

Circle T-53 on Reader-Service Card

Variable-Speed Drive

A variable-speed motor drive for 1-hp. applications is 20% smaller than previous models manufactured by Reeves Pulley Co., Columbus, Ind. The unit is available in speed ranges from 2 to 1 through 8 to 1 and can be obtained in 112 different assemblies to meet exact space requirements. A handwheel control is standard, but mechanical-automatic and electric remote controls are also available.

Circle T-54 on Reader-Service Card

CONTINUED ON PAGE 232

CINDET
ALL-PURPOSE LIQUID SYNTHETIC
DETERGENT

LIFTS DIRT AND HOLDS IT OFF!

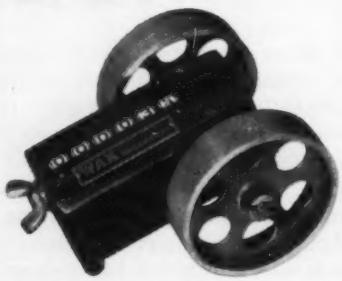
Foamy CINDET LIFTS and DRAWS dirt away, SEPARATING the dirt from the surface and leaving space between, then HOLDS DIRT PARTICLES IN SUSPENSION for quick, easy pick-up. Leaves a cleaner, brighter surface than when soaps, powders or ordinary "detergents" are used. Produces rich, creamy suds when diluted in either HARD or SOFT water, and it's SAFE—won't harm hands or any surface unaffected by plain water. Wonderful for stripping old wax from floors and removing stubborn RUBBER MARKS.

CINDET has hundreds of general cleaning uses. Write for literature or have your Dolge Service Man demonstrate its quick, thorough action.

FOR FREE SANITARY SURVEY OF YOUR PREMISES SEE YOUR DOLGE SERVICE MAN

dependable **DOLGE**
WESTPORT, CONNECTICUT

YOU CAN COUNT ON WAK* COUNTERS



Hank Clocks	Hosiery Counters
Rotary Counters	Pairing Counters
Tenter Counters	Yardage Counters
Inspection Counters	Slasher Counters
Pick Clocks	Sewing Counters
Twister Clocks	Special Counters

* T.M. Reg. U. S. Pat. Office

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CHARLOTTE, NORTH CAROLINA

for pure finish...

VICTOR P-40-U

BRIGHTER SHADES AND WHITES...
SMOOTHER HAND

improved finishing starches

for backfill...

VICTOR 10-55

ALWAYS UNIFORM...CARRIES MORE TALC...
MORE MELLOW HAND

Charles C. Switzer, Vice President
TEXTILE SALES DIVISION
1200 S. C. NATIONAL BANK BLDG.
GREENVILLE, SOUTH CAROLINA

THE KEEVER STARCH CO. ★ GENERAL OFFICES ★ COLUMBUS 15, OHIO
Processors of corn, wheat and blended starches for industry since 1898

CORN PRODUCTS REFINING COMPANY

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A COMPLETE LINE

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STARCHES, GUMS & DEXTRINES

Highly recommended for their superior uniformity, stability and cleanliness

GLOBE® BRAND CORN STARCHES

Ideal where a thick boiling starch is required for use in homogenizers. Globe Pearl Corn Starches produce strong films, reducing breaks on the slasher and on the loom. Globe brand extra thick starches produce a smooth, lardy paste.

GLOBE® GUMS AND DEXTRINES

Preferred for warp sizing spun rayon, spun rayon blends, and synthetics; warps desize readily.

TEN-O-FILM STARCHES

A new line of starch derivatives, similarly applicable, which are gaining wide use where set-back is a factor in the size operation.

EAGLE® BRAND CORN STARCHES

For warp sizing carded and combed yarns. These popular thin boiling starches are available in all fluidities necessary to maintain correct size concentration for best possible weaving.

HERCULES BRAND CORN STARCHES

Used in a variety of sizing applications. These oxidized starches produce a smooth but tough, clear film. Their strength and uniformity help reduce breakage on the loom, cut down shedding.

TAKE ADVANTAGE of our free technical service. Our lab and field experts will welcome the opportunity to help you with actual production problems. Write us today.

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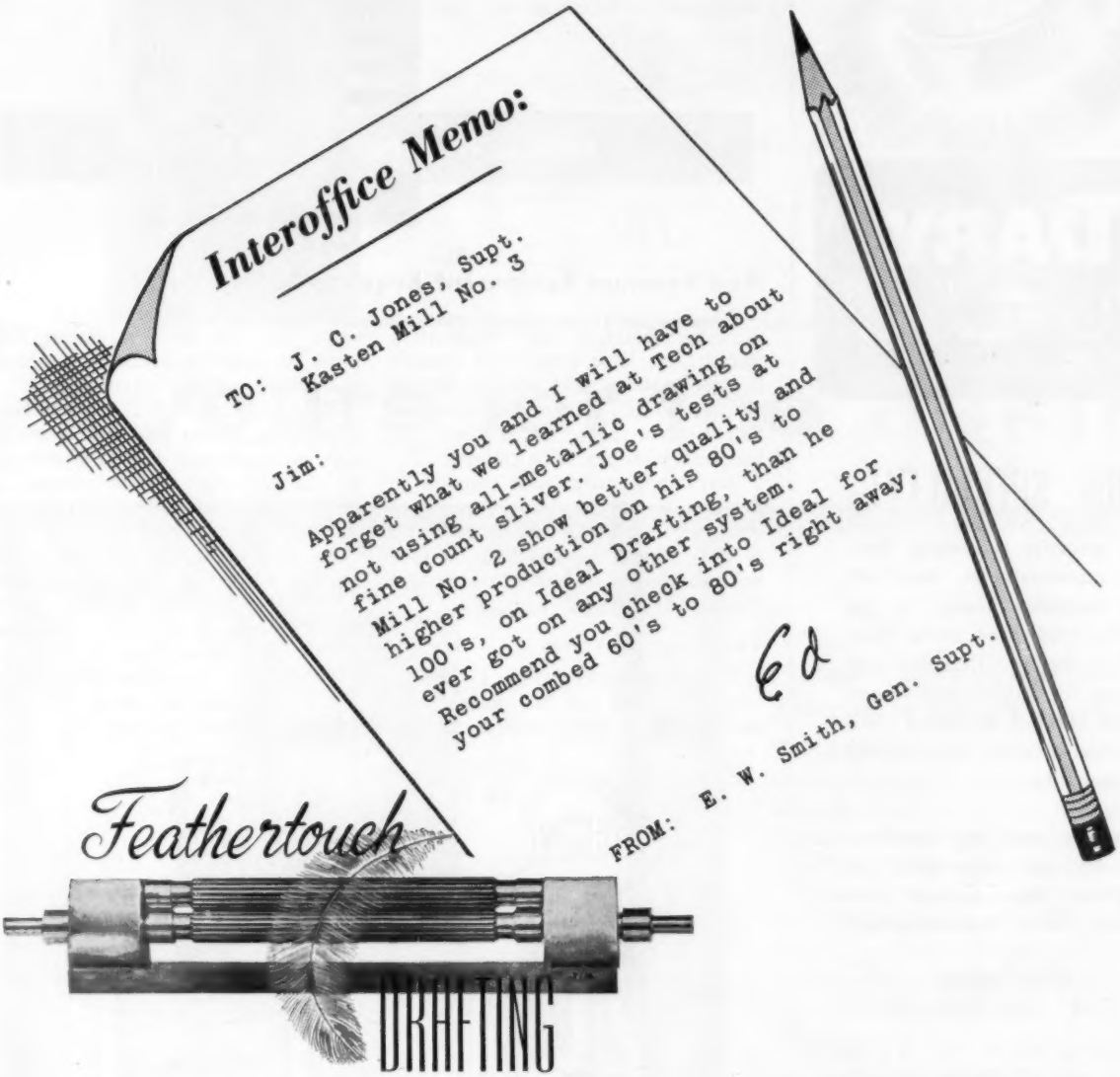
Yes, we said "Fine Counts"


Interoffice Memo:
TO: J. C. Jones, Supt.
Kasten Mill No. 3
Jim:
Apparently you and I will have to forget what we learned at Tech about not using all-metallic drawing on fine count sliver. Joe's tests at Mill No. 2 show better quality and higher production on his 80's to 100's, on Ideal Drafting, than he ever got on any other system. Recommend you check into Ideal for your combed 60's to 80's right away.
Ed
FROM: E. W. Smith, Gen. Supt.

Some mills, which were successfully using Ideal Feathertouch Drafting on carded stock, hesitated to use it for fine counts and for combed yarn because of former prejudice against using metallic rolls on fine counts. Those who conducted tests have uniformly made reports like the one above. Today many of the largest and finest mills are running *all* of their finest counts on Ideal Feathertouch Drafting.

Ideal's patented ball bearing spacing sections keep the rolls perfectly aligned at all times. Free-floating fluted top rolls give only a light feathertouch to the stock. They automatically even out thick and thin places in the sliver and impart a permanent crimp. Ideal High Speed Ball Bearing Drawing* cannot bruise, crush, or cut fibres. Even on the finest counts, Ideal Feathertouch Drafting gives you the highest quality drawing sliver. And Ideal Feathertouch Drafting costs less to buy, less to run, and less to maintain. Write for full information today.

*Patent Nos. 2,610,303; 2,490,544; 2,412,357. Other patents pending.

Ideal Industries, Inc.
Bessemer City, N. C.

For more information, write direct or use Reader-Service post card.

DARY
Ring Travelers

OUR SPECIALTY!

Our specialty is making Dary ring travelers — an item well and favorably known to the textile trade for more than half a century. Though times change, we at Dary hold to one course without deviation. We continue to serve, by pursuing our specialty.

When you need ring travelers, call on our experience to aid your choice. Consult your friendly Dary representative!

Always specify
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THE DARY RING TRAVELER CO.
TAUNTON, MASSACHUSETTS
LINDSEY I. PHILLIPS, TREASURER, TAUNTON, MASS.
JOHN H. O'NEILL, BOX 720, ATLANTA, GA.
JAMES M. CARVER, BOX 22, RUTHERFORDTON, N. C.
CRAWFORD "JACK" RHYMER, BOX 2261, GREENVILLE, S.C.

MILL MAINTENANCE

New Pressure Equipment Requires Safety Valves

Many chemical and refrigeration installations have introduced hazards because noxious and volatile liquids or gases under pressure are involved. Safety valves relieve the tendency for excessive pressures to be created.

Any safety valve must respond to pressure and open when the pressure reaches the point at which the valve is set. However, the fluid handled will make valves of different designs respond in different ways.

Two Types of Valves

Pop safety valves (Fig. 1) have a popping action and are made to be used on gas or vapor service. In this valve, the blow-back regulating ring must be properly adjusted to obtain the desired popping action.

Relief valves (Fig. 2) do not have a popping action and are primarily used on liquid service. They respond to the rise and fall in pressure as gentle and rapid as the rate of pressure change in a system.

Safety relief valves are constructed on the same basic principle as pop safety valves. When used on gas or vapor service, they have a popping action. But when they are used on liquid service, the blow-back ring is either removed or made inactive. Then they have no popping action

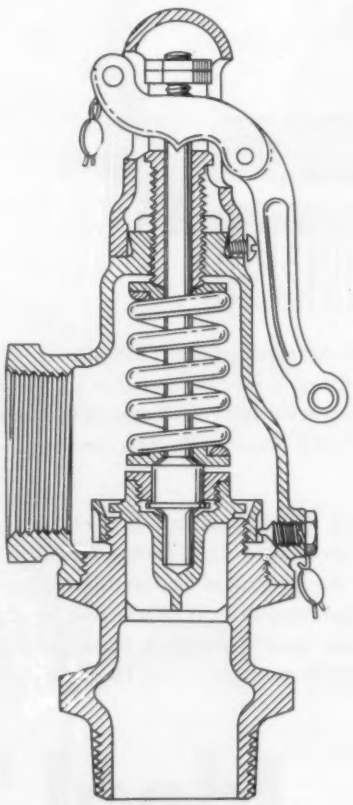


Fig. 1

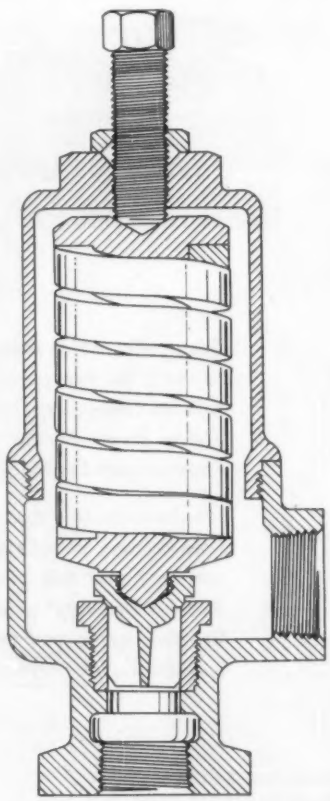


Fig. 2

TECHNICAL BULLETIN ON *UVERSOFT* "D"

Send me technical information on Harshaw Uversoft "D"

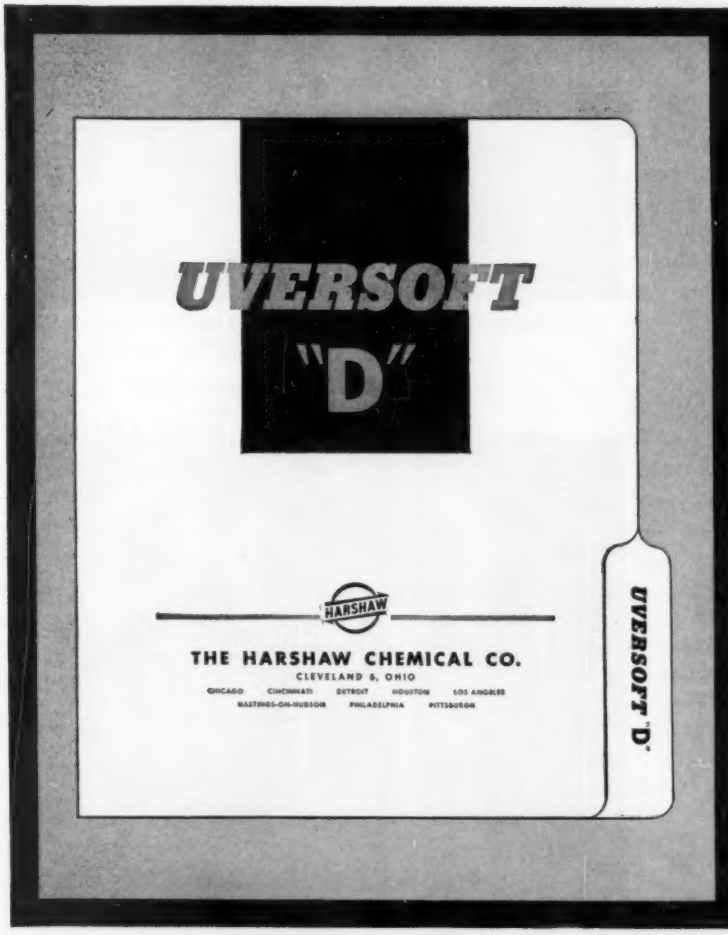
My Name_____

Company Name_____

Street Address_____

City_____ Zone____ State_____

yours for the asking



Imparts Soft Hand With Little Reduction In Moisture Absorbency

UVERSOFT "D" is a cationic surface active agent which produces a full, soft hand with little, if any, reduction in moisture absorbency of the TREATED material. It can be exhausted from a long bath, and has an excellent retention in an aqueous system. UVERSOFT "D" provides a maximum economy in application and use.

UVERSOFT "D" is an outstanding anti-static agent. It should be considered for situations where the accompanying softening action is not objectionable.

Send for folder containing complete technical information.

THE HARSHAW CHEMICAL CO.

1945 EAST 97th ST., CLEVELAND 6, OHIO

Here is PROOF of extra PROFITS

available for you in TUBULAR KNIT with a

PROCTOR CONTINUOUS BLEACH RANGE

featuring

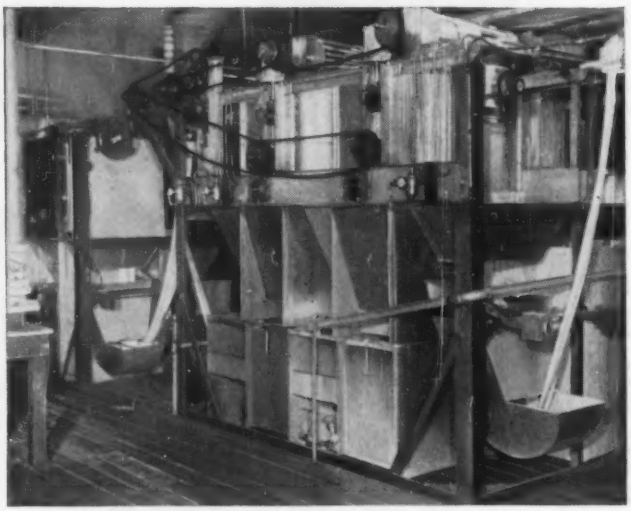
★ **CONSISTENT QUALITY**
★ **ELIMINATES RERUNS**
★ **REDUCED LABOR, CHEMICAL, AND WATER COSTS**
★ **SIMPLIFIED OPERATION**

A recent Proctor Continuous Bleach installation, producing 1300 to 1500 lbs. per hour, offers definite proof of greater yields of top quality tubular knit produced at drastically reduced costs.

SORTING ELIMINATED Not only does the Proctor Continuous Bleach Range feature simplified operation with less labor, but the consistent quality, regardless of styles or weight of cloth being processed, eliminates cutting room sorting—assures matched garments and speeds cutting schedules.

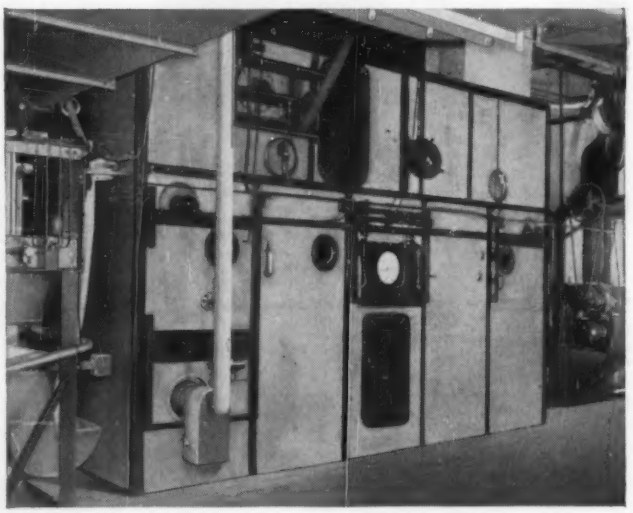
CAN APPLY FLUORESCENT DYE In addition to conducting the cloth, without tension, through washing, saturating, steaming, and white washing stages, your Proctor range can be adapted to apply fluorescent dyes with high efficiency and low chemical and water costs.

PAYS FOR ITSELF IN THREE YEARS The Continuous Bleach Range is a result of years of intensive study by Proctor engineers. The result is tubular knit with minimum shrinkage produced at lowest cost per yard. Most ranges pay for themselves out of extra profits in a few years. Since savings will vary from mill to mill, a Proctor engineer will be glad to visit your plant in order to analyze your particular case. Write or phone today!



ABOVE: Installation View of Con-o-matic Washer in Continuous Bleach Range.

BELOW: Installation View of Steamer Unit in Continuous Bleach Range.



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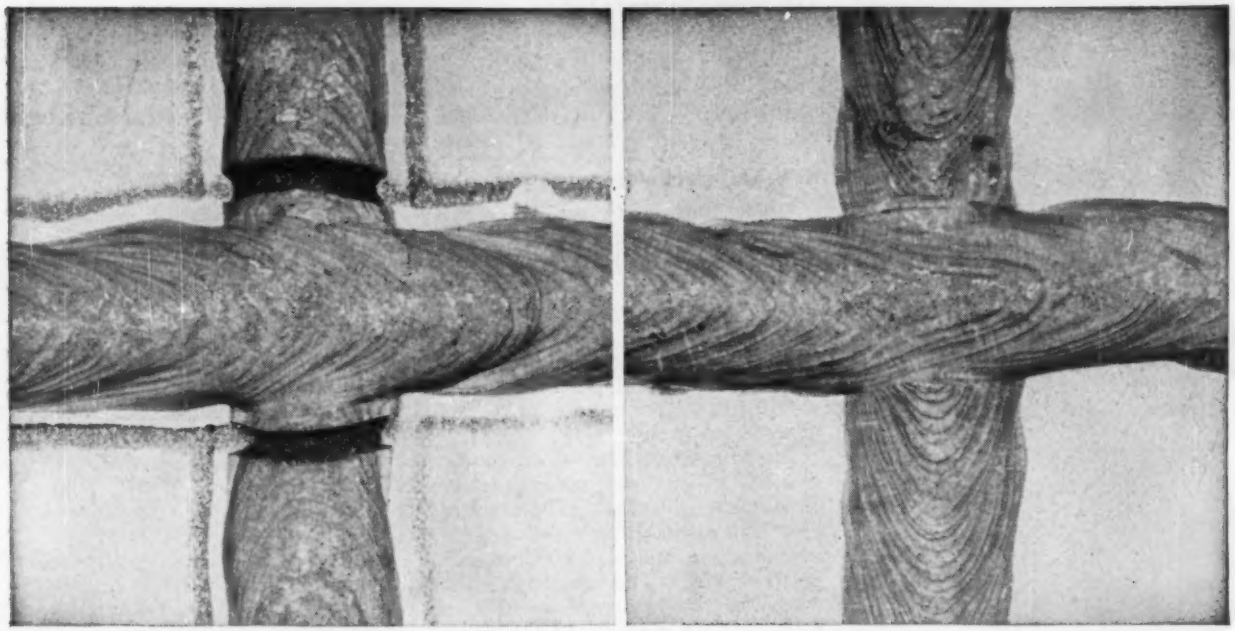
AUTOMATIC BLENDING SYSTEMS • WEIGHING FEEDS • PICKERS • SHREDDERS • BALE BREAKERS • SYNTHETIC CARDS • GARNETTS • DRYERS FOR FIBROUS MATERIAL • YARN DRYERS • HOT AIR SLASHER DRYERS • CLOTH CARBONIZERS • ROLLER DRYERS AND CURERS • LOOP AGERS FOR PRINT GOODS • TENTER HOUSINGS • OPEN-WIDTH BLEACH SYSTEMS FOR WOVEN FABRICS • MULTIPASS AIRLAY DRYERS • NYLON SETTING EQUIPMENT • CON-O-MATIC WASHERS • CONTINUOUS BLEACH SYSTEMS FOR PRODUCING TUBULAR KNITS • EQUIPMENT FOR "KEEPMANIZED"® SHRUNK-TO-FIT FABRICS • CARPET DRYERS

PROCTOR & SCHWARTZ, INC.

Manufacturers of Textile Machinery and Industrial Drying Equipment
Philadelphia 20, Pa.



Two welded samples were tested for three 4-hour periods in a solution of 10% nitric and 3% hydrofluoric acid at 176 F. Specimen at left showing acid attack alongside welds is regular Type 304; specimen at right, free from acid attack, is Armco 18-8 ELC (Type 304L).

PROTECT WELDED STAINLESS EQUIPMENT AT LESS COST WITH ARMCO ELC

You needn't take chances on carbide precipitation adjacent to welds in textile equipment. Armco offers two extra-low carbon (ELC) stainless steel grades that are completely satisfactory for service in welded equipment up to 800 F. They are:

ARMCO 18-8 ELC (TYPE 304L)
ARMCO 18-12 MO ELC (TYPE 316L)

THEY SAVE YOU MONEY

Armco 18-8 ELC costs less than the columbium- or titanium-stabilized Types 347 and 321, yet insures the same freedom from intergranular corrosion in the recommended temperature range as the more expensive types. The Armco ELC types are produced in sheets, strip, plates, bars and wire.

"EXTRA-LOW-CARBON" DOES IT

Armco ELC grades contain a *maximum of only 0.03% carbon.* This small amount of carbon is not enough to cause harmful carbide precipitation adjacent to welds during welding. Therefore, stabilizing elements are not needed, for either shop- or field-welding.

GET COMPLETE INFORMATION

Let us send you a copy of the article, "How to Control Carbide Precipitation in Welding Stainless Steels." This is the latest and one of the most concise articles ever written on the subject. For more information on the ELC grades, get the booklet, "Armco's ELC Stainless Steels." Just check what you want on the coupon and mail it to us.

ARMCO STEEL CORPORATION
4604 Curtis Street, Middletown, Ohio

☐ Send me a copy of the article, "How to Control Carbide Precipitation in Welding Stainless Steels"
☐ Send me a copy of the booklet, "Armco's ELC Stainless Steels"

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ARMCO STEEL CORPORATION

4604 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO®

SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Ask these questions, too, when you judge a fluorescent lamp...

Is it made with Halo Phosphor?

No other phosphors in use today can match Halo Phosphors for maintaining high light output and original color. Westinghouse (and only Westinghouse) uses Halo Phosphors throughout its entire fluorescent lamp line.

Is it the correct type, size and color for the lighting job to be done?

In the Westinghouse fluorescent family of 290 different lamps—including Slimline and Rapid Start—there's a type and size precisely right for every office, plant and merchandising application. Colors include seven different shades of "white" alone.

How about quality control?

From raw materials to finished product, every Westinghouse fluorescent lamp is subjected to *480 inspections and tests* before approval for shipment.

For the full story on how to get more for your money in fluorescent light, contact your Westinghouse Lamp Representative.

YOU CAN BE SURE...IF IT'S

Westinghouse

MILL MAINTENANCE — Continued

and become simple relief valves.

Modern safety valves are commonly spring-loaded. The old dead-weight valve is outlawed by most safety codes.

How To Select Valves

Select your safety valves on the basis of rated discharge capacities, and not on pipe size. The capacity of a safety valve should be equal to or slightly greater than the maximum generating capacity or output of the system. Capacities are generally given in pounds of steam per hour, cubic feet of free air per minute, or gallons of water per minute.

For units where vapor is generated, or air or gas is stored, use pop safety or safety relief valves. These valves have high discharge rates and are positive in action, and the blow-down can be controlled. They function best when they are mounted directly to tanks, pressure vessels, and the steam drums of boilers.

How To Avoid Trouble

If pop or safety valves are attached away from the source of supply by pipes, they will likely chatter. Such chattering quickly ruins the seating faces and often ruptures the valve or parts. In addition, the valve does not discharge at its rated capacity. Then there's a possibility of an excessive rise in pressure followed by an explosion.

Although primarily intended to be used on liquid service, the relief valve can be used on any fluid. Its rate of discharge is lower, its action is not as positive, and its closing-off pressure is not as definite as the blow-down of the pop safety valves. Relief valves can be applied to pipe lines.

Tips on Installing Valves

In mounting a valve, use an open-end wrench. A pipe wrench may crush and distort the bases or bodies. Since the inlets generally have tapered pipe threads, excessive pull-up will also cause distortion. Outlet piping not properly supported can also cause distortion.

Apply pipe-thread dope to male threads only, and in limited quantities. Haphazardly applied thread dope can enter the inlet of the valve and coat the seat faces.

Always install safety valves in a vertical position with no restrictions in either inlet or outlet piping.

For noxious or flammable fluids, use valves with a pressure-tight superstructure and a side outlet that permits piping away the discharge. Use stop valves between the safety valve and equipment being protected. *Crane Co.*

EQUIPMENT AND SUPPLY NEWS CONTINUED FROM PAGE 224

Measuring Glass

An improved glass, known as E-2, has been announced by Beckman Instruments, Fullerton, Cal. The new glass, especially suited for high pH measurements, replaces Type E glass in electrodes to be used in measuring pH in highly alkaline solutions. Effective over the entire pH range, the E-2 glass is highly resistant to acids, alkalis, ageing, and surface deterioration.

Circle T-55 on Reader-Service Card

Small Water Still

A portable laboratory water still that provides ½ gal. per hr. of pyrogen-free water has been introduced by Precision Scientific Co., 3737 W. Cortland St., Chicago, Ill. Made of stainless steel and copper, all critical surfaces are block-tin coated to safeguard water purity. Condensing areas are wide and will not clog. The water supply is preheated by the condenser for greater efficiency.

Circle T-56 on Reader-Service Card

Electric Hoist

A wire-rope electric hoist of 250-lb. capacity made by the P&H Hoist Div., Harnischfeger Corp., Milwaukee 46, Wis., sells for $145. The hoist has a 10-ft. lift and operates from lighting-circuit outlets.

Circle T-57 on Reader-Service Card

Small Punch Press

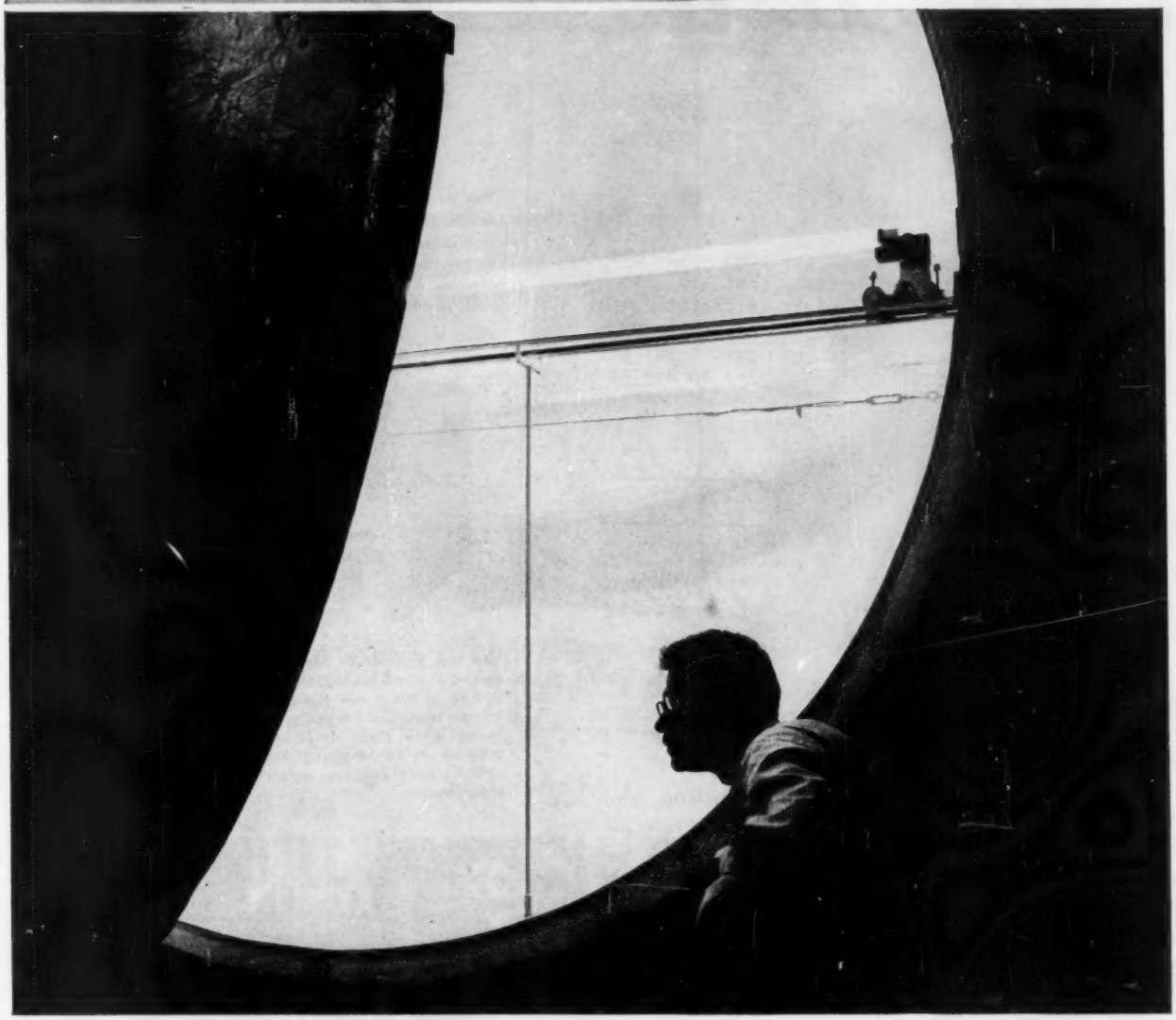
Alva Allen Industries, 1001-1015 N. Third St., Clinton, Mo., has announced a bench-model punch press suitable for pinking, embossing, slotting or cutting operations on many types of material. Designed to relieve presses of small-die work, the press features extra-long main bearings and a 4 ½-in. throat. It will produce up to 250 units per minute and requires a ⅓-hp. motor.

Circle T-58 on Reader-Service Card

Replace Tires on Casters

Casters built with a section easily removed to be replaced with new

how to judge a fluorescent lamp . . . point no. 2



ask about **HIGHEST LIGHT OUTPUT**

Fluorescent lamps deficient in light output are apt to be costly at any price. Reason: in order to attain a given light level with such lamps, you need not only more of the lamps themselves, but also—to hold and operate the extra lamps—*more fixtures and more power*. Thanks to a steady stream of new ideas in its fluorescent lamp design, materials and manufacture—ideas carefully evaluated through photometric testing as shown above—Westinghouse now offers you fluorescent lamps conservatively rated for light output at up to *63 lumens per watt*.

YOU CAN BE SURE... IF IT'S Westinghouse

write us this letter

YOUR LETTER HEAD
ANYTOWN, U.S.A.

date here

Van Vlaanderen Machine Co.
370 Straight Street
Paterson 3, New Jersey

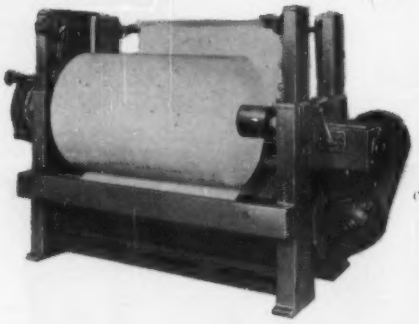
Gentlemen:

Like many another dyehouse, ours still has a number of dyeing machines that are getting old. You may be right in claiming that new high-production machines could improve our competitive position and profit potential. Anyway, we are interested in having your opinion, without obligation of course.

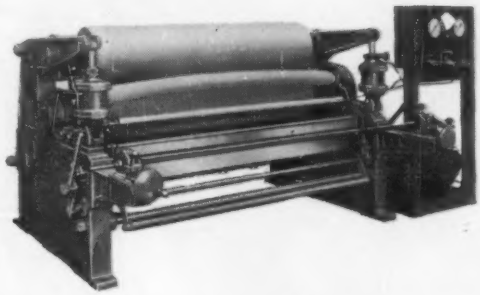
We process _____ machines.
(list types of goods)

on _____
(Jigs, becks, etc.)

Yours very truly,
Your Signature
(Title here)



The Van Vlaanderen Dyemaster gives better results on all fabrics from sheers to heavy ducks. Constant cloth tension, from practically none for sheers to full for cotton ducks, makes the Dyemaster the most versatile American dyeing machine. Even dyeing results are achieved by near-constant cloth speed through a special differential transmission.



The Van Vlaanderen Ten Ton, 2 Roll Padder is a modern, versatile machine for finishing, resin impregnating and dyeing. It has a new slip-clutch take-up, operating through friction plate-clutches for sensitive tension control. Variable speed drive gives quiet, smooth operation. Pneumatic-pressure or micro-spring set optional. Operators' panel controls each cylinder separately to allow equalizing of nip pressure.

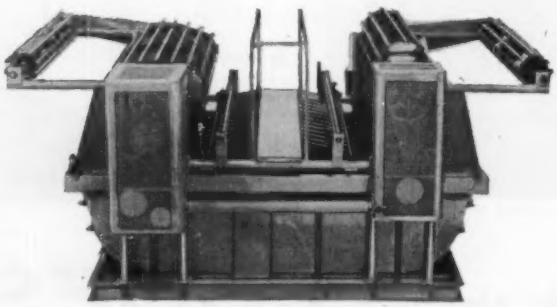
If you are concerned about your competitive position, why not write us a letter like the one above. We are sure we can help improve your profit potential, as we have for many others.

The textile industry has a busy future coming up. For years our population has increased at the rate of 2,000,000 a year and will continue to do so for years to come. Are you in a position to get your share of this ever increasing market?

Why not give a critical look at each of your dyeing machines? Many companies are still using some equipment that has lost it's profit making possibilities. Van Vlaanderen can show you that replacement with modern equipment will give you better production, better quality work and better profits.

Whether you need a single machine or an entire plant you should have the benefit of our 53 years of know-how.

Our engineers invite your inquiry.



The Van Vlaanderen Duplex Dyeing Machine is a patented reel dyeing machine especially designed to do continuous strand-form piece dyeing of all qualities of goods from lingerie sheers to heavy dress fabrics. Has nearly double capacity with the same floor space compared with the old-fashioned single dye reel.

VAN VLAANDEREN

VAN VLAANDEREN MACHINE COMPANY

370 Straight Street, • Paterson 3, New Jersey

In the South — Parrott and Ballentine • 610 South Carolina National Bank Building • Greenville, South Carolina

WORLD'S LARGEST MANUFACTURER OF MACHINES FOR PROCESSING MODERN FABRICS

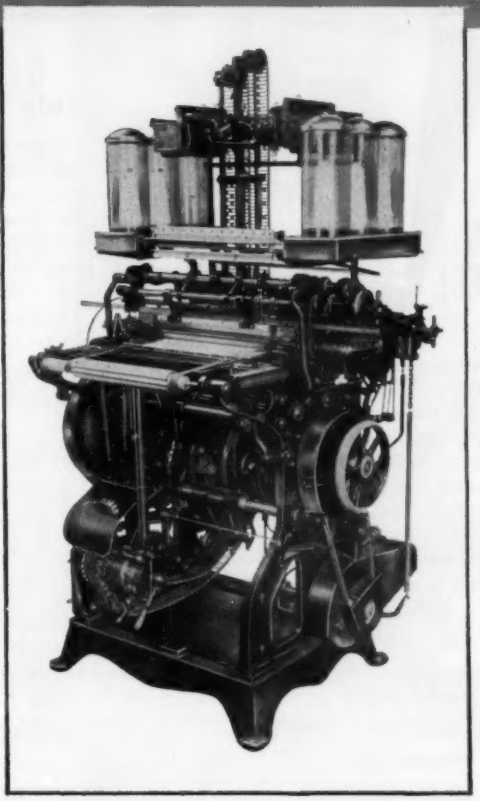
Every Textile Mill Needs

rubber tires are offered by Wellington Machine Co., 133 De Wolf St., Wellington, Ohio. The rim and tire

Features of the equipment are chemical resistance to most acids, salts, alkalis, and many organic chemicals,

ADD UP THESE GOOD POINTS—

- One operator can attend 24 to 30 machines — producing the maximum per eight hours.
- Each machine completely assembled and adjusted at factory.
- Being single section, no production time is lost due to idle sections.
- Narrowing and widening changes are completely automatic.
- No maladjustment due to temperature changes.
- Needle breakage is unusually low.
- The sheer hosiery produced is tightly knit with high elasticity — longer wearing — beautiful to see, lovely to touch *and easy to sell!*



AND YOU'LL FIND THE TOTAL IS 75

THE FULL FASHIONED HOSIERY MACHINE FOR THE HIGH-GAUGE, HIGH-PROFIT MARKET . . . BY

WILDMAN *makes the machines that tend to their own knitting.*

WILDMAN MFG. COMPANY, NORRISTOWN, PA.

MANUFACTURERS OF: FULL FASHIONED HOSIERY MACHINES; CIRCULAR MACHINES FOR OUTERWEAR, UNDERWEAR, SPORTSWEAR, TRIMMINGS; STOP MOTIONS

Every Textile Mill Needs This Steel Handbook

IT'S FREE!

Latest, complete stock and weight handbook. Tells at a glance the types, sizes and shapes of steel warehouse products carried for you by one of the South's largest steel warehouses. Saves you valuable time. We'll be glad to send a copy on request. Then, you can easily order by phone, whatever you need, one piece or a carload.

- **Cold-finished Shafting**
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- **Structurals**
- **Stainless Steels**

24 to 48 HOUR DELIVERY Throughout the South BY TRAIN • BY TRUCK

WAREHOUSE DIVISION

Atlantic Steel Company

575 14th St. N.W., Atlanta 1, Georgia. EMerson 3451

rubber tires are offered by Wellington Machine Co., 133 De Wolf St., Wellington, Ohio. The rim and tire are easily changed in a few minutes with a wrench. The tire is guaranteed not to loosen, stretch, or roll off. Thread guards protect the bearings from lint and loose threads.

Circle T-59 on Reader-Service Card

Scale That Prints

A portable scale equipped with an attachment for printing information on cards as items are weighed is available from Toledo Scale Co., Toledo 1, Ohio. Thus, a record of all material weighed is made right at the scale. Weighing capacities range from 125 to 2,000 lbs. The counting capacity is 2,500 lbs.

Circle T-60 on Reader-Service Card

Reversible Fan

A reversible fan for both ventilating and exhaust jobs is the latest addition to the line of fans manufactured by Hartzell Propeller Fan Co., Piqua, Ohio. The double-ring fan is available in direct-connected, belt, and pulley drives. Sizes are 28-, 36-, and 44-in. dia.

Circle T-61 on Reader-Service Card

Hammer Has Several Heads

It takes only 10 secs. to change the heads on a hammer developed by Hi-Lok Mfg. Co., 1625 Massillon Rd., Akron, Ohio. Heads of aluminum, brass, copper, nylon, and plastic are furnished.

Circle T-62 on Reader-Service Card

Loading Dock

A hydraulically operated adjustable loading dock manufactured by Rowe Methods, Inc., 2534 Detroit Ave., Cleveland, Ohio, has an operating capacity of 20,000 lbs. It is raised or lowered for various sizes of vehicles and platforms with push-button controls.

Circle T-63 on Reader-Service Card

Polyethylene Laboratory Ware

Laboratory beakers and graduated cylinders made of polyethylene are being produced by American Agile Corp., P. O. Box 168, Bedford, Ohio. Features of the equipment are chemical resistance to most acids, salts, alkalis, and many organic chemicals, all at temperatures up to 175° F. The leakproof containers are of molded construction, or molded and welded.

Circle T-64 on Reader-Service Card

Sealless Pump

Pumps that require no packing have been announced by Chempump Corp., 1300 E. Mermaid Lane, Philadelphia, Pa. The S series pumps are totally enclosed, and the pumped liquid serves as a coolant to rotor and stator while the pump is in operation. Semifloating Graphitar bearings can be replaced without breaking piping connections. Made in ¼- to 3-hp. models, the pumps will deliver up to 170 gals. per min. at a 150-ft head up to 350° F. working temperature.

Circle T-65 on Reader-Service Card

Wet-Dry Vacuum Cleaner

An explosionproof vacuum cleaner to be used in hazardous locations has been developed by Clarke Sanding Machine Co., Muskegon, Mich. The Wet-Dry Vac can be used in atmospheres containing many chemicals. The wet capacity is 15 gals.; dry capacity is 1⅞ bu.

Circle T-66 on Reader-Service Card

Flooring Material

An easy-to-use material for repairing concrete and composition floors has been developed by Maintenance, Inc., Wooster, Ohio. The material is also used to resurface floors; a 55-gal. drum will cover 200 sq. ft. of floor to a thickness of ⅜ in.

Circle T-67 on Reader-Service Card

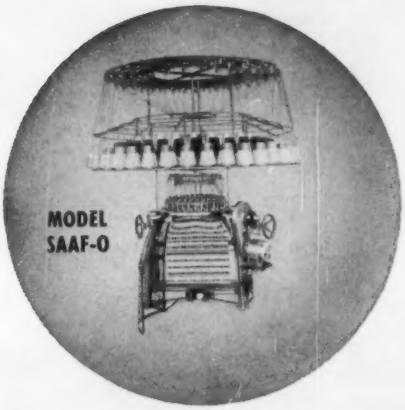
Combination Meter Socket

A service-entrance device that combines a meter socket and circuit-breaker load center in a single unit is announced by Trumbull Components Department, General Electric Co., Plainville, Conn. The new design provides wiring economies and installation and servicing convenience.

Circle T-68 on Reader-Service Card

Strapping Machine

A fully automatic strapping machine for wrapping, tensioning, and sealing steel bands around cartons has been



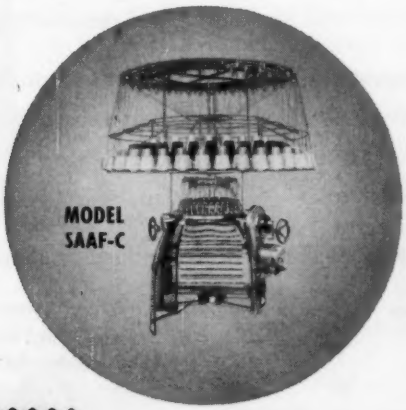
These features make SUPREME

HIGH SPEED PRODUCTION

Large number of feeds, rugged construction and stationary yarnstand give you vari-striped and patterned fabrics at unprecedented rates. Standard 26" machine has 32 four color striping boxes — 32 three position pattern wheels—32 automatic pattern placers.

the latest word in modernized, low-cost knitting

of automatic, variable striped, patterned or solid jersey *with* or *without* knit-on simulated rib trim and draw thread section separators



TREMENDOUS VERSATILITY

Striping boxes, pattern wheels and placers on every feed let you pour out an infinite variety of striking, multi-colored fabrics — with pattern inserts twice the size previously possible. Knit a wide variety of fabric construction and textures with virtually any type of natural or synthetic yarn.

HIGH QUALITY AT LOW COST

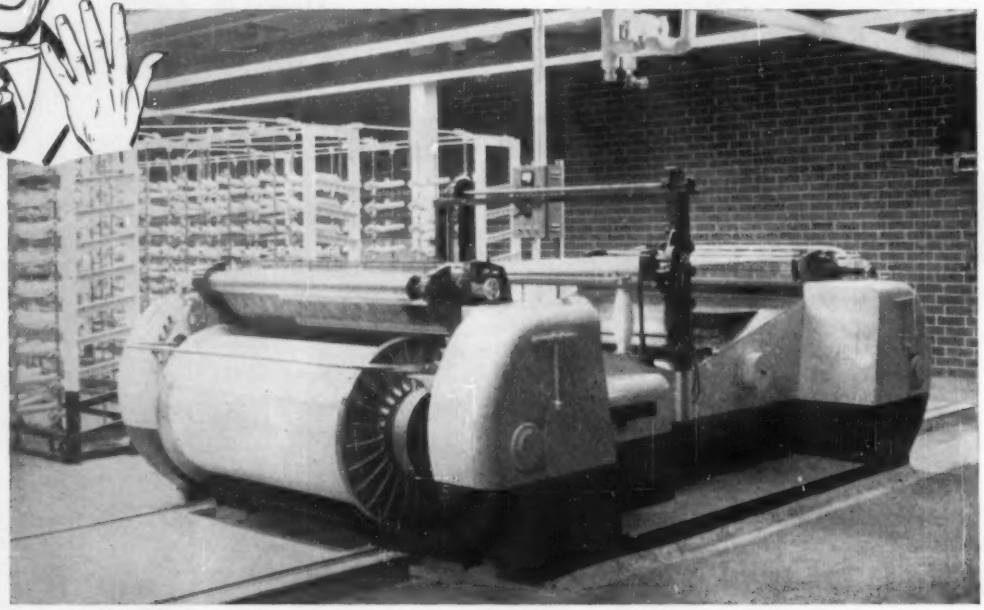
Knitting efficiency and quality are insured by these ingenious new features—128 cone, "step-design" (Pat. Pend.) yarnstand, new knitting elements system, new striping box with easy, manual setting, new pattern placer with slideable studs for fingertip control and new, scissor-type, synchronized "no-waste" cutters.

SUPREME
KNITTING MACHINE CO., INC.
94-02 100th STREET, OZONE PARK 16, N. Y.
Southern Representative and Showroom:
The Mallack Co., 711 S. Tryon St., Charlotte, N. C.

Ask For This FREE Booklet On
SUPREME'S NEW "PAY-AS-YOU-DEPRECIATE" FINANCING PLANS
The PAYD Plan

Another Example of Cocker Flexibility

Special Cocker Rebeamer



This Cocker Rebeamer was especially designed by Cocker to meet some unusual conditions. It enables operator to wind and back wind beams for inspection and repair, with complete control ot both tension and speed at all times. Special features of this Rebeamer are air-operated doffing, air-operated presser roll, and rheostatically controlled individual brakes.

This Rebeamer is just another example of Cocker's flexibility in solving unusual problems. Cocker engineers have 40 years of practical and successful engineering experience upon which to draw. Cocker's own complete foundry, machine shop, and sheet metal shop assure strictest quality control.

For all warp preparatory equipment . . . standard or special . . . always call on Cocker.

New England and Canadian Representative:
J. S. Fallow & Co., 279 Union St., New Bedford, Mass.
4846 Sherbrooke St. W., Montreal, Canada

THE LEADER
COCKER
AROUND THE WORLD

Machine and Foundry Co., Gastonia, N. C.

WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT

Now there's a better way to carry

textile fibers

to market

Here is a MICARTA® shipping bobbin developed especially to withstand the squeeze of tightly wound textile fibers. Currently in use by one of the world's largest textile producers for the shipment of textile fiber, this new bobbin is proving itself ideal in a punishing application. Its remarkably high resistance to compression, impact and moisture absorption is seeing it through a record-breaking number of round trips from plant to converter without damage to bobbin or fiber.

Let us show you how this amazing new MICARTA bobbin can perform for you. Write Westinghouse Electric Corporation, MICARTA Division, Hampton, South Carolina. J-06609

YOU CAN BE SURE...IF IT'S Westinghouse

micarta®

textile products

EVERY YARN NEED

Unrivaled service
Unlimited color scope
Renowned quality

NATURAL RAYON AND ACETATE YARNS

•

DYEING OF RAYON, NYLON AND ACETATE YARNS

•

METALLIC YARNS

•

THROWN YARNS

•

ALL PUT-UPS... SKEINS, SPOOLS, CONES, TUBES, CAKES, PACKAGES!

"COMBINED TO SERVE YOU BETTER"

Malina Company Atlantic Rayon Corporation

NEW YORK PLANT AND OFFICES:
111 Eighth Ave., New York 11, N. Y. WAtkins 9-7200
NEW ENGLAND PLANT AND OFFICES:
86 Crary Street, Providence 1, R. I. DExter 1-1190

introduced by General Strapping Corp., 100 Park Ave., New York 17, N. Y. The machine handles various box sizes without adjustments.

Circle T-69 on Reader-Service Card

Miniature Setscrews

A complete line of miniature hex-socket capscrews and setscrews in diameters of No. 0 through No. 3 is being produced by Allen Mfg. Co., Hartford 2, Conn. Lengths run from $\frac{1}{8}$ to $\frac{1}{2}$ in. The screws are manufactured in both coarse and fine threads. The screws are used for a wide variety of very small devices and instruments.

Circle T-70 on Reader-Service Card

Lamp Holder

A lamp holder to be used with its line of 800 MA Rapid-Start Lamps is being offered by Benjamin Electric Mfg. Co., Des Plaines, Ill. The holder is used with both two- and three-lamp lighting equipment.

Circle T-71 on Reader-Service Card

Gear Fastening Device

Gripspring, a device developed in Germany, fastens hubs and gears on shafts without splines or keyways. The assemblies are manufactured and sold in the United States by U. S. Automatic Corp., Amherst, Ohio.

Circle T-72 on Reader-Service Card

Better Fluorescent Lamps

Two important improvements to its 96-in. T-12 rapid-start fluorescent lamp have been announced by General Electric Co., Nela Park, Cleveland 12, Ohio. The improvements, de luxe cool white and de luxe warm white, result in improved color renditions and an increase of 7% light output.

Circle T-73 on Reader-Service Card

Container with Drop Door

A container with a drop door has been developed by Gaylord Container Corp., 111 N. Fourth St., St. Louis 2, Mo. The drop door makes it possible for the loading employee to reach to the bottom of the box while he is packing. The door is then shut for shipment.

Circle T-74 on Reader-Service Card

Level Controller

A level controller has been developed by Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. Fourth St., Philadelphia 33, Pa. The device, called Pneutronic level control, utilizes the accuracy of electronic capacitance sensing elements to detect minute changes in levels in tanks, drums, process baths, and other containers.

Circle T-75 on Reader-Service Card

Electrical Foot Switch

An electrical foot switch developed by The Birtcher Corp., Los Angeles, Calif., makes positive contact no matter where it is pushed—on top or anywhere on its circumference. It can also be activated with hand, elbow, or knee, whichever is most convenient for the operator.

Circle T-76 on Reader-Service Card

Valve Positioner

An accurate valve positioner designed for precise control action has been announced by The Foxboro Co., Foxboro, Mass. The positioner overcomes friction, reduces line effects, and speeds valve response to the controller signal. Applications include large-volume diaphragm motors and processes where controller-to-valve distances are long.

Circle T-77 on Reader-Service Card

Renewable Gate Valve

A renewable ring-seat gate valve that allows replacement of the ring seat in 7 to 10 mins. under all conditions with just a screwdriver has been announced by The Fairbanks Co., 393 Lafayette St., New York 3, N. Y.

Circle T-78 on Reader-Service Card

Static-Pressure Control

The Cat. 114P Control, developed by The Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N. Y., is approved and listed by both Factory Mutual and Underwriters Laboratories, Inc., for use as an air-fuel interlock in packaged steam generators requiring safeguards when lack of forced draft presents a hazard.

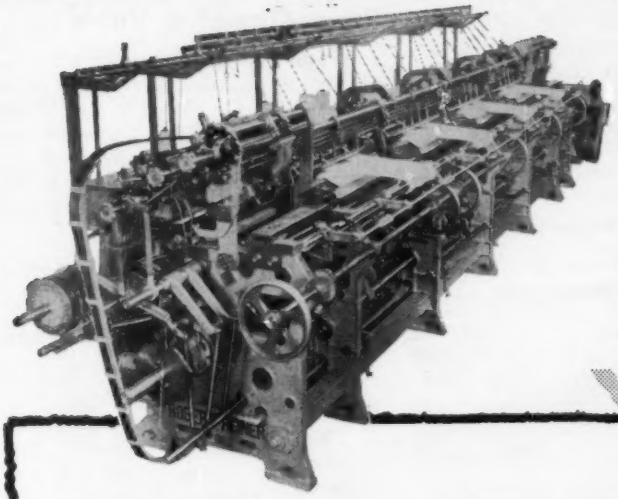
Circle T-79 on Reader-Service Card

CONTINUED ON PAGE 242

There is no better salesman than a satisfied customer.

HERE IS WHAT USERS OF

REINER Automatic full fashioned SWEATER MACHINES say:



1) *"We are very glad to tell you that your full fashion sweater machines are working beautifully and that we are producing 14 dozen sweaters every eight hours on 3 four section Reiners. As a matter of fact, we are certain that production on three machines can be stepped up to 17 dozen per eight hours."*

2) *"We wish to express appreciation for the cooperation your company has shown us to date in the problems we have had getting organized on Reiner Full-Fashioned Machines . . ."*
(In this mill girl operators are running Reiners.)

3) *"We are glad to let you know that our three Reiner machines are in full production and perform to our entire satisfaction. We have no difficulty making fifteen dozen every eight hours. We would like you to know that the machines were set up in a matter of hours, after just removing the shipping oils we were producing in just a few hours."*

4) *"All the machines are running well . . ."*

5) *"We are progressing nicely . . ."*

WE SHALL BE GLAD to tell you more and give you the names and addresses of the mill owners quoted here. Moreover, we will take you to a mill running Reiners 'round the clock, producing top quality at high speed. Write us on your stationery and we will arrange everything.

Our Schaffhouse flat power unit is doing fine, too. In other words: Reiner is your best bet when it comes to buying the perfect team for making full fashioned sweaters.

With Reiner, you are assured of a dependable and prompt source of spare parts. Skilled Reiner technicians are always at your service.

ROBERT REINER, INCORPORATED

Telephone: UNion 7-0502—From New York City call LOngacre 4-6882.

WEEHAWKEN *(Only 10 minutes from Times Square by direct bus)* **NEW JERSEY**

THE
Number One Name
In Socket Screws & Keys
ALLEN

Don't take it for granted that any hex socket screw is an Allen. Your Allen Distributor *alone* can offer you

1. **ALLENPOINT SET SCREWS** with the new smaller point — proved by impartial laboratory tests to have greater locking power and vibration resistance, plus uniformly high shaft holding power, compared with conventional cup point screws and those with serrated or angled points.
2. **LEADER POINT CAP SCREWS,** for substantially reduced chance of thread injury or damage to threaded holes.
3. **ALLENOY STEEL** — with the strength and temper to permit the use of smaller sizes, and make button head and flat head screws practical despite necessarily shallower sockets.
4. **ALLEN PROGRESSIVE PRESSUR-FORMING,** producing contoured uncut fiber flow, from head to point. A process originated and perfected by Allen.

Be sure to get Allens in the black and silver striped box, sold only through leading Industrial Distributors. Write us for technical information.

ALLEN
MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

Small Telephone Amplifier

A pocket-size telephone amplifier has been introduced by Remler Co., 2101 Bryant St., San Francisco, Calif. Designed for telephoning in noisy places, the device clips on a phone and increases the acoustic output up to 3½ times. It can be easily transferred from one phone to another.

Circle T-80 on Reader-Service Card

Motor-Load Indicator

The MEK-2127 motor-load indicator has been introduced by Machinery Electrification, Inc., Northboro, Mass. The unit has easy-to-read scales calibrated in either percent load or horsepower. Large color bands let the operator see at a glance how the machine is performing.

Circle T-81 on Reader-Service Card

Combustion Analyzer

The Cities Service Heat Prover combustion analyzer is available from Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio. The instrument weighs about 25 lbs. and analyzes gas samples for oxygen and combustibles gas content.

Circle T-82 on Reader-Service Card

Full-Port Valve

A full-port normally closed valve that does not require back pressure in its operation has been announced by Magnatrol Valve Corp., 71 Fifth Ave., Hawthorne, N. J. The valve will operate and hold fully open without flow pressure and with low pressures.

Circle T-83 on Reader-Service Card

Controlled-Volume Pump

A controlled-volume pump with an instrument air-stroke-length adjustment has been announced by Milton Roy Co., Station N, 1300 E. Mermaid Lane, Philadelphia 18, Pa. The pump was designed to solve specific low-capacity flow-control problems in pneumatic process-control systems.

Circle T-84 on Reader-Service Card

Globe Valve

A globe valve designed for use on liquid-immersed electrical transformers has been announced by Crane Co., 836 S. Michigan Ave., Chicago 5, Ill. The valve, Catalog No. 121, comes in ¾-, 1-, 1¼-, and 2-in. sizes and is rated for 150 lbs. maximum pressure at 200° F. maximum temperature.

Circle T-85 on Reader-Service Card

Positioning Relay

A positioning-relay kit for field application to any air-operated control valve has been announced by Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, Ohio. The relay is said to solve such valve-positioning problems as stuffing-box friction load, poor response, unbalanced inner valves, and hysteresis.

Circle T-86 on Reader-Service Card

Power-Operated Valve

A four-way disk valve for air, gas, oil, or water service is available from Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles, Calif. The valve features power operation to forward, reverse, and neutral positions. It is designed for remote control and power operation.

Circle T-87 on Reader-Service Card

Small Clutches and Brakes

Miniature electromagnetic clutches and brakes measuring less than 1 in. in diameter have been developed by Dial Products Co., 9 Avenue E, Bayonne, N. J. The units are useful in applications where a simple disconnect or nonchattering brake is required.

Circle T-88 on Reader-Service Card

Safelock Receptacles

Many safety features are incorporated into the multipurpose safelock receptacles announced by Industrial Automation Corp., 2415 W. Montrose Ave., Chicago, Ill. The units were designed to eliminate dangers of fire and explosion caused by sparking in hazardous areas. Extension cord sets cannot be removed or inserted until the trip lever is actuated.

Circle T-89 on Reader-Service Card

Diaphragm Control Valve

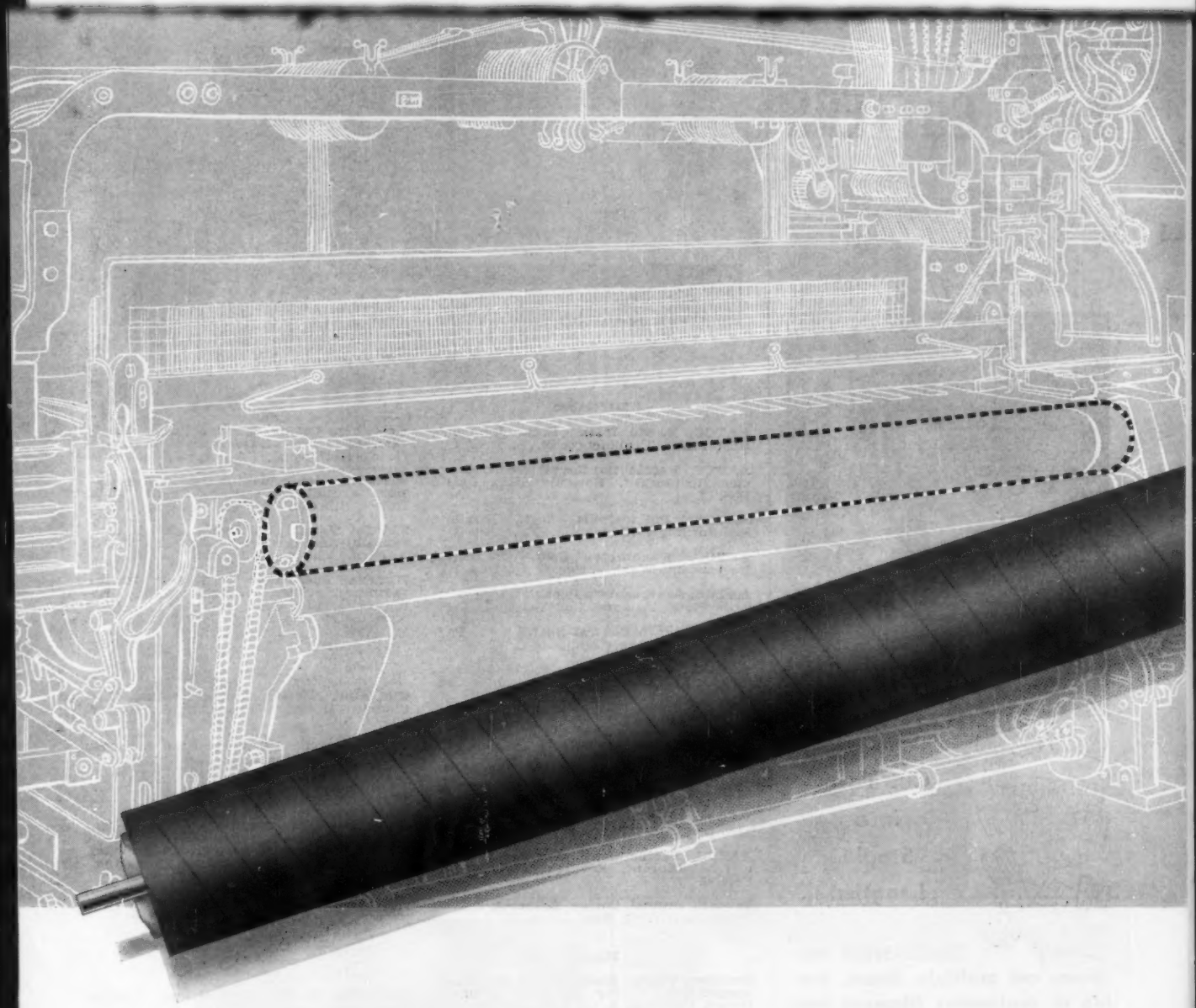
The Bantam Bellows sealed-diaphragm control valve for positive, leakproof control of hazardous flows has been announced by George W. Dahl Co., Inc., 430 High St., Bristol, R. I. Bellows rating is 500 psig. at from −70° to 700° F.

Circle T-90 on Reader-Service Card

Device for Portable Mixers

Claw-shaped propellors for portable mixers are being produced by Craddock Equipment Co., 1507 A St., Wilmington, Del. The propellors

TAYLOR, STILES



Eliminate loom take-up roll marks

If you're having trouble with take-up roll marks, try Armstrong NO-732 Roll Covering. It has an even, finely textured surface that handles the most delicate loom-finished fabrics safely.

This unusual take-up roll covering is made of a special synthetic rubber compound developed by Armstrong—a compound that provides up to *twice* the holding power you'd normally expect from a rubber material. It gives you firm, uniform take-up tension from selvage to selvage.

A sturdy fabric backing gives NO-732 Covering extra strength and good adhesion to the roll. Like all Armstrong Loom Supplies, this covering is designed to give years of dependable service.

A test in your weave room will prove how well NO-732 Roll Covering handles all kinds of fabrics. Your Armstrong man will be glad to supply samples and additional information.

For your copy of the booklet, "Armstrong Textile Roll Coverings and Mill Supplies," write Armstrong Cork Company, Industrial Division, 6912 Dauphin Street, Lancaster, Pennsylvania.

Armstrong LOOM SUPPLIES

... used wherever performance counts

LOOM CLUTCH DISCS AND INSERTS • PRESS ROLL COVERING • LOOM BRAKE AND LET-OFF STRIPS • TEMPLE ROLL COVERINGS

MICRO SWITCH Precision Switches

TAYLOR, STILES

YARN CUTTERS

Cut Yarn into Staple Lengths.

Taylor-Stiles machines cut multiple slivers, roving or continuous filament into any desired staple length.

The shearing action of the knives cuts the nylon yarn being processed in this picture cleanly into 2" lengths —without fusing at high production rates.

The length of cut is readily changed by either a change in the sprockets or by means of a variable speed motor.

Write today for information regarding these and other Taylor-Stiles Textile Cutters.

TAYLOR-STILES & COMPANY

15 Bridge Street Riegelsville, N. J.

CALENDAR

December

AATCC, Rhode Island Sect., Johnson's Restaurant, Providence, R. I., Dec. 1.

AATCC, Pacific Southwest Sect., Gourmet Restaurant, Beverly Hills, Calif., Dec. 2.

AATCC, Philadelphia Sect., Kugler's Restaurant, Philadelphia, Pa., Dec. 2.

AATCC, Washington Sect., Occidental Restaurant, Washington, D. C., Dec. 2.

AATCC, Southeastern Sect., Atlanta Biltmore Hotel, Atlanta, Ga., Dec. 3.

AATCC, South Central Sect., Hotel Patten, Chattanooga, Tenn., Dec. 10.

AATCC, Western New England Sect., Rapp's Restaurant, Shelton, Conn., Dec. 16.

1956

January

Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Pa., Jan. 23 to 26.

February

AATCC, Pacific Southwest Sect., Gourmet Restaurant, Beverly Hills, Calif., Feb. 6.

Seventh Annual Cotton Research Clinic, Pinehurst, N. C., Feb. 15 to 17.

March

Southern Textile Methods and Standards Association, spring meeting, Clemson House, Clemson, S. C., March 22 & 23.

April

American Cotton Manufacturers Institute, annual meeting, Hollywood Beach Hotel, Hollywood, Fla., April 5 to 7.

Alabama Cotton Manufacturers Association, annual convention, Buena Vista Hotel, Biloxi, Miss., April 11 to 13.

Phi Psi Textile Fraternity, annual convention, Alabama Polytechnic Institute, Auburn, Ala., April 19 to 21.

National Association of Hosiery Manufacturers, annual convention, Boca Raton Hotel and Club, Boca Raton, Fla., April 28 to May 1.

May

The Fiber Society, spring meeting, The Clemson House, Clemson, S. C., May 2 and 3.

Tufted Textile Manufacturers Association, national meeting, Cavalier Hotel, Virginia Beach, Va., May 31 to June 2.

June

Materials Handling Institute Exposition of 1956, Public Auditorium, Cleveland, Ohio, June 5 to 8.

The Fiber Society, fall meeting, Warwick Hotel, New York, N. Y., Sept. 6 & 7.

October

Southern Textile Exposition, Textile Hall, Greenville, S. C., Oct. 1 to 5.

EQUIPMENT & SUPPLY NEWS Continued

may be supplied for any make of mixer or as standard equipment on the Craddock Super-Mixer. The three-bladed stainless-steel propellors are stocked in eight sizes from 3-in. to 12-in. dia.

Circle T-91 on Reader-Service Card

Battery Charger

A six-circuit battery charger for both lead-acid and Edison batteries is being produced by The Hertner Electric Co., 12690 Elmwood Ave., Cleveland 11, Ohio. The chargers are simple to operate and can be used by truck operators without danger of overcharging batteries.

Circle T-92 on Reader-Service Card

Traffic Controller

A traffic controller that regulates the flow of goods from two merging conveyors can be used with either belt or live-roller conveyors. The controller is available from The Rapids-Standard Co., Inc., Rapistan Bldg., Grand Rapids 2, Mich.

Circle T-93 on Reader-Service Card

Portable Drum Lift

Sterling, Fleishman Co., Broomall, Pa., is producing a portable drum-lifting tool that can be operated by one man. The tool sells for less than $200 and lifts drums weighing 700 lbs.

Circle T-94 on Reader-Service Card

... used wherever performance counts

LOOM CLUTCH DISCS AND INSERTS • PRESS ROLL COVERING • LOOM BRAKE AND LET-OFF STRIPS • TEMPLE ROLL COVERINGS

MICRO SWITCH Precision Switches
A PRINCIPLE OF GOOD DESIGN

Textile Operations are more automatic... safer and more productive with

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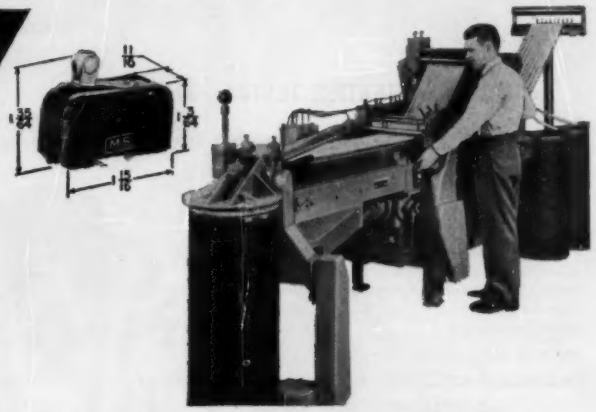
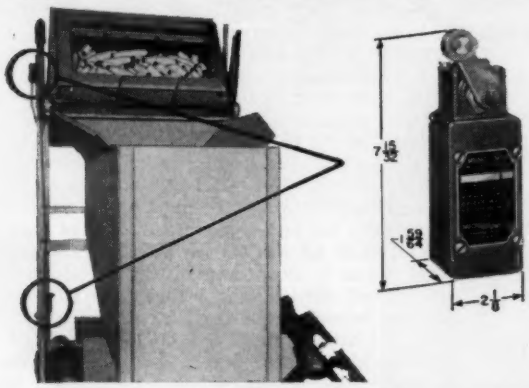
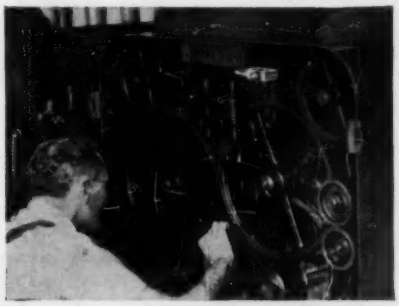


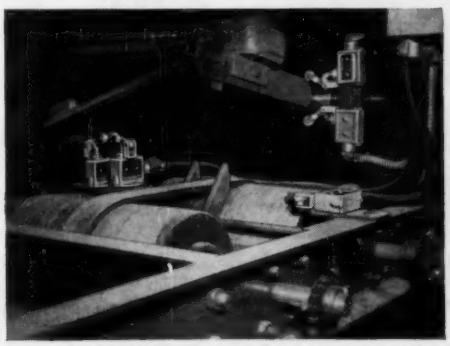
• Help maintain smooth flow of materials on Warner & Swasey's Pacific Converter. Roller leaf actuated switch is extremely sensitive and accurate.



• Make quill loading an automatic job by limiting up and down travel of hopper. Ruggedly housed limit switch withstands high humidity and linty atmosphere.

• Shuts off power when gear box is opened on spinning frames. Switch has sufficient overtravel to take banging of heavy doors.





• Give automatic control of cloth tension on clothing measuring machine. Fully adjustable roller arm switch actuators signal any change in position of dancer roll.

Whether you are a manufacturer of textile equipment or a plant operation man, it will pay you to know about MICRO SWITCH Precision Switches. Send for Catalog 101—Switches for Industry—and the name of the distributor nearest you. An experienced switch engineer is available at any of 22 branch offices.

A complete line of snap-action and mercury switches

MICRO SWITCH provides a complete line of extremely reliable, small-size, high-capacity, snap-action precision switches and mercury switches. Available in a wide variety of sizes, shapes, weights, actuators and electrical characteristics. For all types of electrical controls.

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3 GURLEY TEXTILE TESTS: STANDARDS FOR THE INDUSTRY

1. GURLEY AIR PERMEABILITY TEST FOR STANDARD TEXTILES

New Model *Gurley Permeometer* takes only 15 seconds for testing air permeability. Use it for filter fabrics and accurately measuring windproofness, coating penetration, filler-retention, water-resistance of fabrics permitting passage of from 1 to 400 cu. ft. of air/min./sq. ft. at pressure drop of 0.5".

Write for Bulletin 1400.

2. GURLEY AIR RESISTANCE TEST OF TIGHTLY WOVEN FABRICS

Easy-to-use, accurate *Gurley Densometer* tests for porosity, air resistance and air permeability of windproof cloth, gabardine, canvas, poplin and many other fabrics below Permeometer capacity. Preferred equipment in textile labs everywhere.

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3. GURLEY STIFFNESS AND PLIABILITY TESTS

Motor-driven *Gurley Stiffness Tester* quickly expresses stiffness and "handle" of fabric in specific figures. Precision-balanced pointer pivots in jewel bearings, indicates stiffness factor of test piece on sine scale. Range includes practically all textiles.

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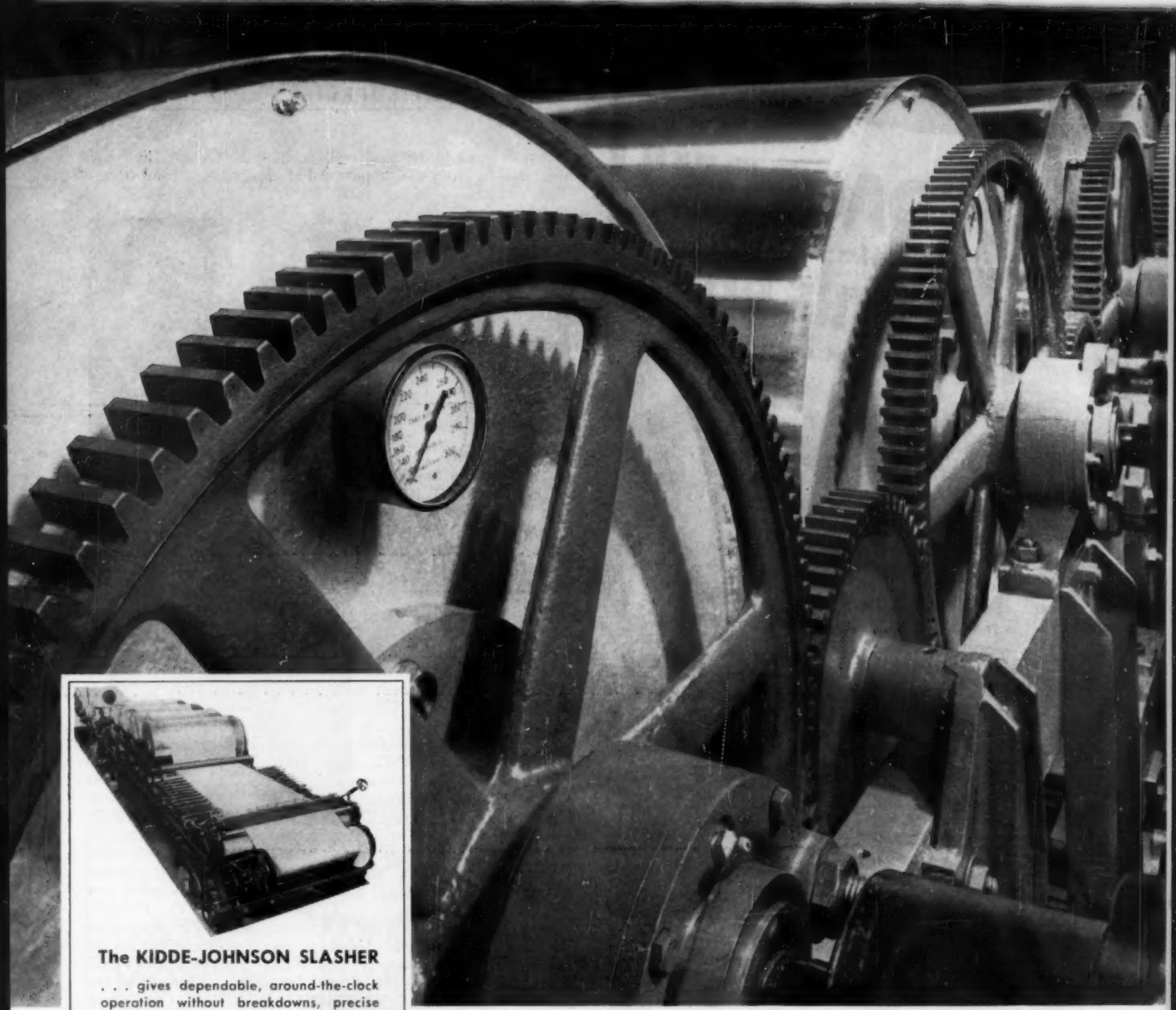
NEWS about SUPPLIERS

AMERICAN CYANAMID CO., New York, N. Y.—Has established its third two-year graduate fellowship at the Institute of Textile Technology, Charlottesville, Va. . . . **AMERICAN MOISTENING CO.**, Providence, R. I.—Has elected Marvin M. McCall a vice president. He will be located at the company's new plant now under construction at Cleveland, N. C. . . . **AMERICAN PAPER TUBE CO.**, Port Gibson, Miss.—Has elected Robert J. Guerin president and treasurer to succeed Harald L. Amrhein, resigned. Edmond H. Guerin, Jr., has been elected vice president, assistant secretary, and assistant treasurer. . . . **APEX CHEMICAL CO., INC.**, New York, N. Y.—Has named Robert L. Keasler its representative in South Carolina and Georgia. . . . **BUFFALO FORGE CO.**, Buffalo, N. Y.—Has elected William R. Heath executive vice president of the company. George P. Schivley has been appointed director of manufacturing. . . . **CELANESE CORP. OF AMERICA**, New York, N. Y.—Has named Arthur V. Boyce assistant district sales manager in the New England district. The company is establishing extensive development laboratories at the marketing department of the Textile Div. in Charlotte, N. C. . . . **CENTURY ELECTRIC CO.**, St. Louis, Mo.—Has established a new district office in Birmingham, Ala., under the direction of N. Cardella. Another new district office has been established in Spokane, Wash., with B. J. Gill as Northwest district manager. . . . **CROMPTON & KNOWLES LOOM WORKS**, Worcester, Mass.—Has purchased the Wrap-King Corp., Holyoke, Mass., and the Carl N. Beetle Plastics Corp., Fall River, Mass. This purchase is part of the company's long-range product-diversification program. . . . **CURTIS & MARBLE MACHINE CO.**, Worcester, Mass.—Has transferred Thure Bylund to its sales office in Greenville, S. C. . . . **DAYTON RUBBER CO.**, Dayton, Ohio—Expects to have the expansion program now under way at its Waynesville, N. C., plant completed early in 1957. The additional space will provide increased facilities for the textile and loom-supplies divisions of the company, as well as for the Koolfoam Div. . . . **DURANT MFG. CO.**, Milwaukee, Wis.—Has opened a new branch office in New Rochelle, N. Y. B. J. Glista has been appointed New York district office manager. . . . **GENERAL ANILINE & FILM CORP., ANTARA CHEMICALS DIV.**, New York, N. Y.—Has an expansion program under way in the liquid-detergent field.

LEON P. BRICK (left) has been elected executive vice president and acting president of Onyx Oil & Chemical Co., Jersey City, N. J. WILFRED W. LUFKIN, JR., (center) has been named a vice president of Celanese Corp. of America, New York, N. Y., and president of its foreign trading subsidiaries. FRED BIEBER (right) has been elected president of Acrometal Products, Inc., Minneapolis, Minn.



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. . . gives dependable, around-the-clock operation without breakdowns, precise control of size temperature, drying heats, speeds and stretch. Available with 5, 7, 9 or more cylinders for either silk or cotton system warping or combinations of both.

The Kidde-Johnson Slasher is

geared for even warp tension

The smooth, steady operation of the KIDDE-Johnson slasher is built in part by part. The cylinder drive, for example: a sturdy, precision gear system, the drive keeps warp tension constant at the desired setting . . . needs a minimum of maintenance.

Every part of the KIDDE-Johnson slasher . . . from the stainless steel size box to the heavy-duty 20-inch friction beam drive . . . is built for rugged service. The result is a unit which will run for years and years with only routine preventive maintenance required.

Our free, 20 page brochure tells all about this famous warp-sizer . . . how and *why* it will eliminate the element of chance in your sizing. Write today for your copy. Address:

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TRICOT AND RASCHEL MACHINES • TRICOT WARPERS • HORIZONTAL WARPERS
BEAMERS • CREELS • SLASHERS • WINDER-REDRAWS • TENSOMETERS

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Emkatex — for color dispersing
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Brochure available giving complete details. Arrange for a demonstration at your plant. Write, wire, phone:

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JUNIOR EMPIRE

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The American Crayon Company
Sandusky, Ohio New York

NEWS ABOUT SUPPLIERS Continued

A new manufacturing plant will be built in Calvert City, Ky.; additional facilities will be provided at Linden, N. J.; and storage

BERNARD MENIN (left) has been appointed assistant manager of the Textile Sales Development Dept., E. F. Houghton & Co., Philadelphia, Pa. FRED T. HARVELL (center) has been named to the sales staff in the Southern territory of H. F. Livermore Corp., Boston, Mass. W. LAMAR POOLE (right) has been named sales representative in North Carolina and Virginia for Bryant Chemical Corp., North Quincy, Mass.

tank facilities will be leased in Los Angeles and Alameda, Calif. . . . **HART PRODUCTS CORP.**, New York, N. Y.—Has appointed Dr. Sidney Cohen director of the research and development laboratory. Abraham S. Endler has been named to the research and development staff. . . . **R. E. L. HOLT, JR., & ASSOCIATES, INC.**, Greensboro, N. C.—Has opened an office in Greenville, S. C. . . . **F. C. HUYCK & SONS**, Rensselaer, N. Y., will build a 200,000-sq.-ft. plant in Aliceville, Ala. . . . **LENKOTEX CO., INC.**, New York, N. Y.—Has appointed Meadows Mfg. Co., Atlanta, Ga., as its distributor in Atlanta for the Spintex doffer-comb-box units. . . . **ONYX OIL & CHEMICAL CO.**, Jersey City, N. J.—Has named Paul D. Jacobs group leader of the Textile Application Section of the Research and Development Laboratories. . . . **SOUTHERN DYESTUFF CORP.**, Charlotte, N. C.—Has appointed Charles J. Palmer manager of the educational and promotional activities for its new Denivat Everblue dye. . . . **TYER RUBBER CO., INDUSTRIAL PRODUCTS DIV.**, Andover, Mass.—Has appointed D. L. Blyth and David Abbot as sales representatives for its molded rubber products. . . . **UNITED STATES TESTING CO.**, Hoboken, N. J.—Has elected Joseph H. Sutherland to the board of directors. . . . **UNIVERSAL WINDING CO.**, Providence, R. I.—Has named Edward C. Parish, Jr., assistant sales manager of the Twisting Machinery Div. J. Bertram Howarth has been named sales representative in the New England territory to succeed Mr. Parish. . . . **WARNER ELECTRIC BRAKE & CLUTCH CO.**, Beloit, Wis.—Has appointed Wesley E. Timmcke Southern regional manager. He will be located in Atlanta, Ga. . . . **WERNER TEXTILE CONSULTANTS**, New York, N. Y.—Has named Dr. Leland S. Liang to its Marketing Research Dept.

NEIL J. HEASLIP (left) has joined Textile Machine Works, Reading, Pa., as a sales analyst in the Circular Knitting Machine Section. RAYMOND THORNTON (center) has been named technical service manager for Arnold, Hoffman & Co., Inc., Providence, R. I. ARNOLD E. AMADON (right) has been named supervisor of packings and textile sales for Graton & Knight Co., Worcester, Mass.

No Substitute For Cash

It is ready for any emergency. It solves a host of business problems. It enables you to make and sell more and better merchandise – and to deliver it on time, when it is worth most to your customer.

Cash is what you get quickly and continuously when you are Factored by Crompton . . . cash as often and as soon as you ship . . . without recourse . . . and without any further concern or costs in crediting and collecting.

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"WESCO" TOPS THE WORLD'S BEST KNITTING MACHINES

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PRODUCTION WISE - IT'S WESCO

USED ON ALL THESE KNITTING MACHINES:

Bentley	Edmos	Mellor, Bromley	Stibbe
Blackburn	Fidelity	Ordnance Gauge	Supreme
Brinton	Jacquard	Precision Knitters	Tompkins Bros.
Cooper	Lamb	Scott & Williams	Wildman
Crane	Leighton	Stafford & Holt	Wildt

Manufacturers and knitters all over the world buy and specify Wesco. They know from experience Wesco stop motions get the best out of the machines they build and buy. Wesco is the "safety-first" word for Superior Knitting. When you purchase new knitting machine—Specify "Wesco" Electric Stopmotions.

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STOP-MOTION DEVICES CORPORATION

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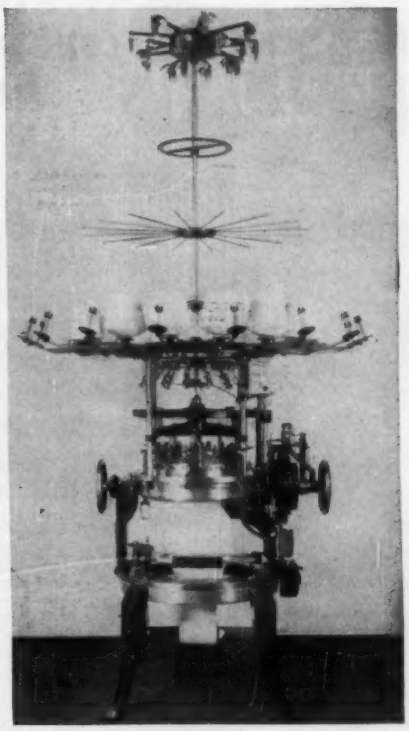
Another of a series of Knitting Machine Builders. Others to follow



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WILDMAN KNITTING MACHINE

Look to NOONE for the Newest Slasher Cloth Developments

At last--an entirely *new* Slasher Cloth, with a well-cushioned body that assures far better slashing of yarn . . . unexcelled starch penetration . . . and greater resistance to abrasion! Extra high tensile strength minimizes tearing. Chemically treated--*at your option without extra charge*--to hold shrinkage at a minimum . . . combat chemical attack and increase service life. Made only from precision-blended, long length, finely selected wools, with rigid quality control in manufacture.

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✓ **CLEARER CLOTH** . . . all wool or cotton back; highest quality—yet, low in price.

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✓ **LAPPING CLOTH** . . . cotton warp; either all wool, or part synthetic filling.

✓ **OTHER SPECIALTY WOVEN FABRICS** . . . developed at your request.

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NEWS about MILLS

COTTON MILLS

Aponaug Mfg. Co., Kosciusko, Miss., has been purchased by a group of industrialists headed by J. L. Moore. Tentative plans call for the expenditure of about $1,200,000 for the modernization of the mill. Three other mills in Mississippi were also purchased by this group, but plans for these mills were not released.

Bates Mfg. Co., Lewiston, Me., is nearing completion of a 15,000-sq.-ft. steel warehouse at the Edwards Div.

Belding Heminway Co., Inc., Putnam, Conn., has purchased a large mill near Grosvenor Dale, Conn., to house the operations of one of the corporation's mills that was washed away during the recent floods. About 700 will be employed.

Cherokee Textile Mills, Knoxville, Tenn., has completed its new $2,500,000 cotton spinning, dyeing, and weaving plant at Sevierville, Tenn. The one-floor plant contains 242,000 sq. ft. of floor space.

Cone Mills, Inc., Greensboro, N. C., will move its New York office to new and enlarged headquarters at 1440 Broadway around Jan. 1.

Drayton Mills, Spartanburg, S. C., is nearing completion of a $400,000 expansion and modernization project that was started early this year. The company is planning another one-story addition that will add 10,000 sq. ft. Drayton's plans include the addition of 7,200 Saco-Lowell spindles.

Jackson Mills, Iva, S. C., is building a 25,000-sq.-ft. addition to house its slashing and spooling equipment. J. E. Sirrine Co. is the engineering firm, and Fiske-Carter Construction Co. is the contractor. An order for 20 SG-1 spinning frames has been placed with Saco-Lowell Shops for delivery after Jan. 1.

Kordite Corp., Macedon, N. Y., is planning a $1,000,000 expansion program for 1957. A new research and development laboratory and additional manufacturing space will be included in the expansion.

LaFayette Cotton Mills, LaFayette, Ga., has reopened after having been shut down for more than a year. The $100,000 worth of stock was purchased by 128 local people. A new corporation has been formed that will manufacture cotton jeans.

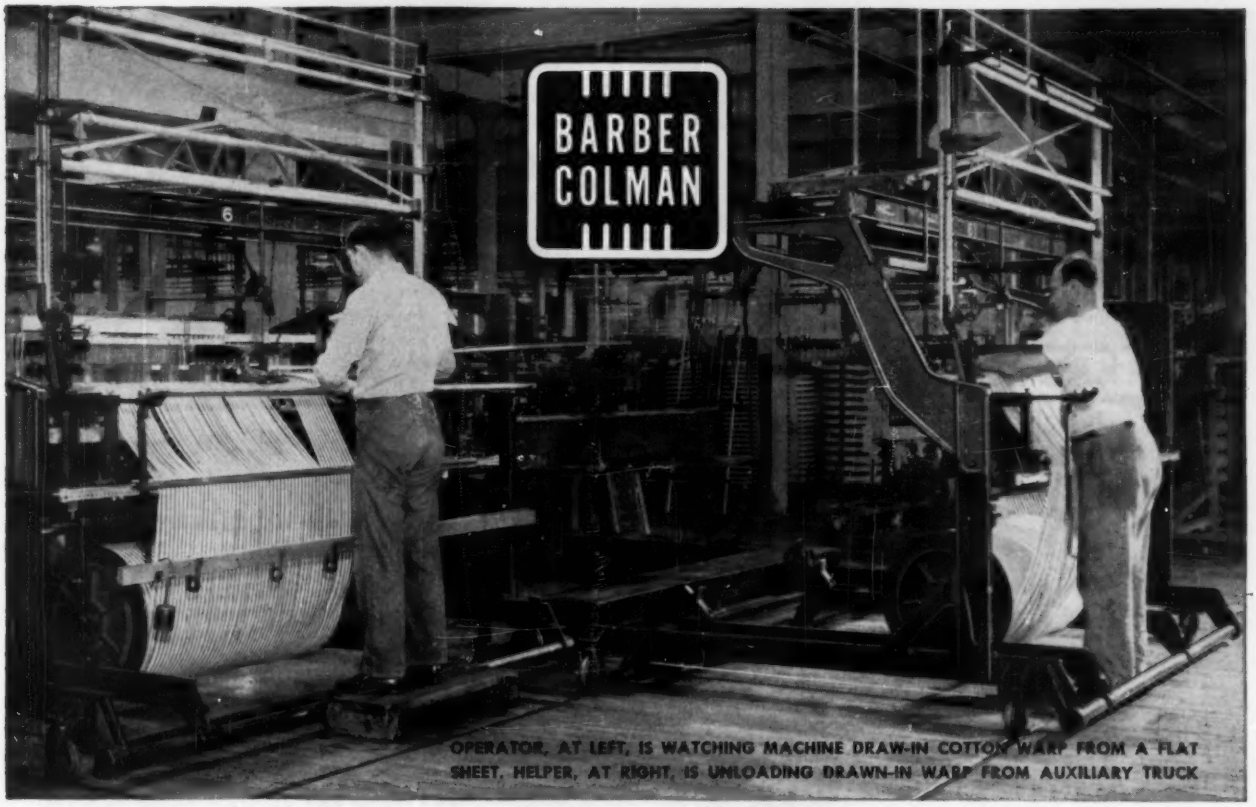
Lumber River Cotton Mills, Inc., Lumberton, N. C., has been formed as a successor to Caledonia Mills.

Narrow Fabric Co., Reading, Pa., has completed a 15,000-sq.-ft. building for the storage of equipment. The one-story building is planned so that it can readily be adapted to manufacturing.

Rhode Island Textile Co., Pawtucket, R. I., is building a $100,000 plant at Landrum, S. C. The plant is expected to be completed by the end of the year.

Rowan Cotton Mills Co., Salisbury, N. C., has ordered approximately $300,000 worth of machinery from Saco-Lowell Shops as part of the mill's expansion program. The order includes 18 Model 56 drawing frames and 16 FS-2 roving frames.

Spofford Mills, Inc., Wilmington, N. C., has merged with M. Lowenstein & Sons, Inc., New York, N. Y.



OPERATOR, AT LEFT, IS WATCHING MACHINE DRAW-IN COTTON WARP FROM A FLAT SHEET. HELPER, AT RIGHT, IS UNLOADING DRAWN-IN WARP FROM AUXILIARY TRUCK

A MACHINE WITH SHARP EYES, QUICK HANDS, AND AN AUTOMATIC "BRAIN"...

If you want to see the complete list of mills now using these machines, and the types of products they weave, write for a copy of the "Users List" shown above. Ask for *Bulletin F 6354*. It is available also in French and German translations.

The operation of drawing-in new warp through drop wires, heddles, and reed is an ever-present problem in all types of weaving. In the old days it was done entirely by hand, and still is in some places — a tedious and tiresome task. The advent of the Barber-Colman Warp Drawing Machines has changed all that, so that you now have a wide range of equipment to suit all needs. Barber-Colman Warp Drawing Machines draw-in the drop wires, the heddles, and the reed *all in one operation.* A needle, operating at 75 strokes a minute or better, picks up each end in sequence and draws it through the proper apertures. Each opening is correctly presented at each stroke of the needle, this selection being accomplished automatically from a metal pattern strip punched in accordance with the designer's draft. Thus the human eyes, hands, and brain have been supplanted by a mechanism that is sharper of vision, quicker of movement, and practically infallible. Results, in mills across the country, and in lands across the sea, show a consistent record of improvements and economies of many kinds. Application is *not* limited to only the larger mills; it is determined actually by the work to be done. *Barber-Colman representatives are qualified by long experience to make a detailed study of your requirements—and to make a proper recommendation if one is justified.* Ask *your* Barber-Colman representative for details.

AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • WARP DRAWING MACHINES

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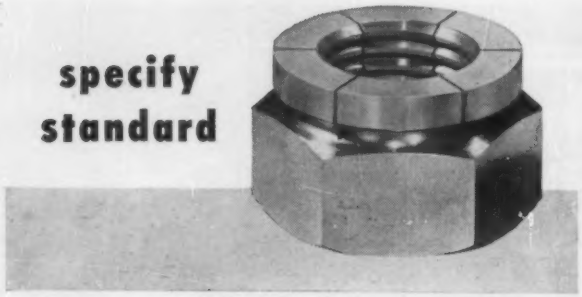
 For more information, write direct or use Reader-Service post card.



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FLEXLOC® SELF-LOCKING NUTS

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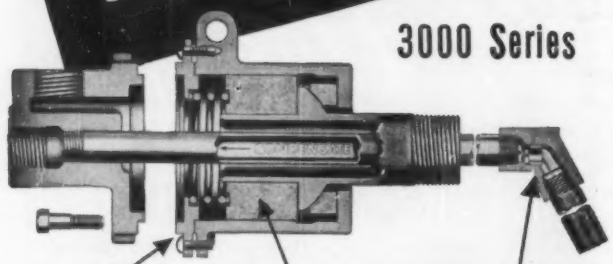
- lock and stop nut in one
- every thread carries its full share of load

DO YOU KNOW? FLEXLOCS do not have to be seated to lock. They lock anywhere on a bolt as soon as the locking threads are fully engaged. And FLEXLOCS are stocked by authorized industrial distributors in a full range of sizes from #4 to 2". Write for Bulletin 866. STANDARD PRESSED STEEL Co., Jenkintown 35, Pa.

FLEXLOC LOCKNUT DIVISION SPS JENKINTOWN PENNSYLVANIA

Johnson Joint with SYPHON ELBOW

3000 Series



ASSEMBLY PLATE — Holds internal parts in position when head is removed.

SELF-SUPPORTING — Needs no external supports of any kind.

SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

WRITE FOR FACTS

on this Series 3000 Johnson Joint and the syphon elbow. Remember Johnson Joints have written an unmatched service record . . . are first choice among mill men and machinery makers alike . . . and can fit all operating needs.

The Johnson Corporation

814 Wood St., Three Rivers, Mich.

NEWS ABOUT MILLS — Continued

Wauregan Mills, Inc., Wauregan, Conn., has resumed operations after damage suffered from the recent flood. The company has installed 60 new Whitin frames in the spinning room. The total damage was $1,500,000.

Wiscassett Mills Co., Albermarle, N. C., has started construction on a two-story, 13,000-sq.-ft. addition to its No. 6 mill. Included in the expansion program is the addition of 36 Model 56 combers, 80 deliveries of Model DS-2 drawing frames, 18 Model FS-2 roving frames, and 96 Model SG-1 spinning frames that were purchased from Saco-Lowell Shops.

WOOLEN AND WORSTED MILLS

Bell Co., is transferring looms from its Worcester, Mass., plant to the company's plant at Clinton, Mass. The dyeing and finishing operations will remain at Worcester.

Cashmere Corp. of America, Weaverville, N. C., has begun construction of a 32,000-sq.-ft. addition to its present mill. All operations in Cleveland, Ohio, will be moved into this area.

A. D. Ellis Mills, Inc., Monson, Mass., damaged in recent floods, has begun reconstruction work. The Ley Construction Co. has been awarded the contract to rebuild the walls and roofs. The amount of machinery to be replaced has not been established.

Fairlawn Wool Spinning Co., Pawtucket, R. I., has been incorporated by Jacob S. Temkin, Samuel Temkin, and William J. Sheehan.

Marbeth Carpet Mills, Dalton, Ga., is building a 10,000-sq.-ft. addition that will house a 15-ft. short-loop machine and the shipping department.

Peerless Woolen Mills, Inc., Rossville, Ga., will build a 250,000-sq.-ft. plant in Cleveland, Tenn. Completion is expected by June, 1956.

SYNTHETICS MILLS

Huntington Yarn Mill, Inc., Philadelphia, Pa., has been incorporated at $10,000. George A. Birkenbach and Cora M. Rudolph head the new corporation.

Joy Silk Mills., Inc., Hartsville, S. C., has changed its name to Joy Throwing Co. The change has been made to more closely reflect present activities of the company. No change in operations is involved.

Lehigh Spinning Co., Allentown, Pa., has acquired a mill adjacent to the present one that increases the available floor space by 30,000 sq. ft. Twisting and winding operations will be located in the new area, and additional spinning facilities will be installed.

A. Wesley Mason & Son Ltd., Montreal, Que., has purchased the 33,500-sq.-ft., one-floor plant and machinery of British-American Silk Mills Ltd., Granby, Que. The cost was estimated at $118,000.

Pennsylvania Ribbon Manufacturers, Philadelphia, Pa., has purchased $10,000 worth of warping and slashing equipment that will increase the firm's production by 15% within the next three months.

A. H. Rice Co., Pittsfield, Mass., has started construction of a two-story addition that will adjoin the present building.

Textured Yarn Co., Philadelphia, Pa., a division of Nathan Schwartz and Sons, has leased 12,000 sq. ft. of floor space that will increase the present production area to 20,000 sq. ft.

KNITTING MILLS

Adler Co., Cincinnati, Ohio, has doubled the size of its mill with the addition of a 40,000-sq.-ft., five-story building.

ARWA, German hosiery manufacturing concern, is establishing a mill in Berlin, N. J. The company has im-

NEWS ABOUT MILLS — Continued

Also investigate our complete machinery and equipment for cutting and brushing of:

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are superior
Ask to see this New high Production napper in operation.

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manufacturers of
TEXTILE MACHINE BRUSHES

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Our Specialty . . . METAL CORE CYLINDER BRUSHES

"FINESET"
Exclusively produced by INDUSCO. Featuring extreme light weight, dense bristle surface, solvent resistant—, By far the best furnisher brush manufactured today.

"TUFTED"
This is an improved metal wound, tufted brush. Engineered to prevent breaking and loosening of wire. Guaranteeing years of satisfactory trouble-free service.

OTHER "INDUSCO"
Metal Core Brushes for Textiles

FLOCK	CARDING
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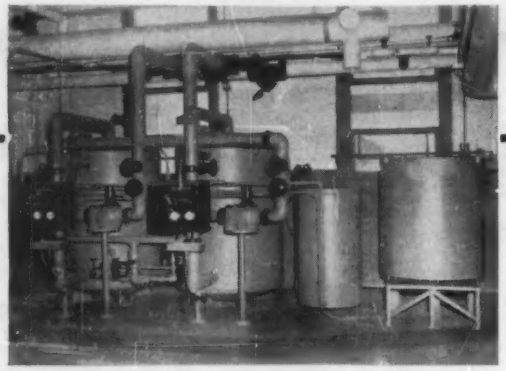
CARBONIZER	LINT REMOVING
TEASELING	STEAMING

"WASHER"
Shown to the left is a SCRUBBER brush. Also available are the HIGH SPEED WASHER and POWDER BRUSHES, giving superior performance.

LEIGHTON TRANSFERS ... featuring



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CLEAR-IRON FREE 100% SOFT WATER

Often For As Little As
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NEWS ABOUT MILLS Continued

ported 20 seamless hosiery machines as the first step in setting up the mill.

Clinton Hosiery Mills Ltd., Toronto, Ont., has been purchased by Besner Teppichfabrik, Hamelin, Germany, and Schmallenberg Strickerwarenfabrik, Schmallanberg, Germany.

Flagg-Utica Corp., Utica, N. Y., will move its entire operation in Utica to Anniston, Ala. The movement will increase the present Alabama manufacturing facilities and boost their employment.

Halton Hosiery Mills, High Point, N. C., is moving its operations from the present downtown location to a plant that formerly housed part of Glenn Hosiery Mills.

P. H. Hanes Knitting Co., Winston-Salem, N. C., plans to enlarge its Spartan, N. C., plant at an estimated cost of $80,000.

Jantzen, Inc., Portland, Ore., has started a $1,000,000 expansion program. New full-fashioned machines and a refinement of gauges of its circular machines now enables the corporation to perform every phase of sweater manufacturing.

Julius Kayser & Co. has sold the fixed assets of its Fairview Mill, Fountain Inn, S. C., to Beaunit Mills, Inc., New York, N. Y.

Long Hosiery Mill, Inc., Marion, N. C., has been incorporated with $100,000 capital stock. Principals are Joseph Long, Majorie Long, and B. H. MacSorley.

Jeff Moore, Inc., Hope Valley, R. I., has been formed through the purchase of the Kidde Knit Dept. of Charbert, Inc., Westerly, R. I., by Geoffrey Moore. The new firm will specialize in 36-gauge rayon and nylon knitted fabrics.

Nylonet Corp., Miami, Fla., has purchased the women's nylon foot-sock division of Janedale Hosiery Mills, Inc., Philadelphia, Pa.

Penlyn Knitting Mills, Philadelphia, Pa., has been reorganized and incorporated and will shortly begin an expansion program. Al Goldstein, formerly president of Penlyn, has been elected president of the new corporation. Lawrence Borofsky has been named secretary and production manager. Jack Soowal is treasurer.

Wisteria Hosiery Mills, Inc., Gastonia, N. C., has installed seven Reading 51-gauge, 30-section hosiery machines. This mill was recently purchased by Roxborough Co., Philadelphia, Pa.

DYEING AND FINISHING PLANTS

Erwin Mills, Inc., Erwin, N. C., has begun work on a 6,500-sq.-ft. addition to the dyehouse. Daniel Construction Co. is the contractor. A continuous vat-dyeing machine has been purchased from Greenville Steel & Foundry Co. Completion is expected early in 1956.

Fairforest Co., Eagle & Phenix Div., Columbus, Ga., is constructing a 6,500-sq.-ft. addition to the finishing plant. Production will be increased by 25%.

Forrest Piece Dye Works, Easton, Pa., has resumed full operations following the recent flood.

Pacific Mills, Lyman, S. C., has installed four new printing machines in a 14,700-sq.-ft. addition.

Union Bleachery, Greenville, S. C., does not have a $1,000,000 expansion under way on its sewage-treatment plant, as was erroneously reported in these columns in our October issue.

Watuppa Finishing Corp., Fall River, Mass., has started operations in 5,000 sq. ft. of floor space in the former Kerr Mills. The company expects to employ 200.

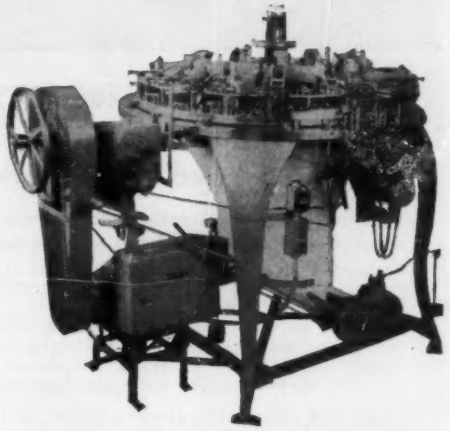
Fred Whitaker Co., Philadelphia, Pa., is taking over the 135,000-sq.-ft. Amerotron plant at Raleigh, N. C., for use as a high-temperature dyeing operation. New equipment is being purchased for this plant.

How Metallizing saves

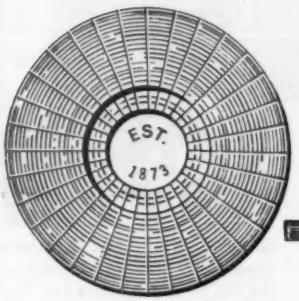
LEIGHTON TRANSFERS — *featuring*
30″ TWELVE FEED MACHINE

Also small sizes to knit *Seamless* Sleeves and Bodies for Infants' Wear; sizes 2, 4, 6, and up. No cutting. No sewing. Perfect Racked Edges are adaptable to either 1&1, 2&1, 2&2 Cuffs.

Other Leighton Knitting Machines include:—Three Needle Selective Rack with two or four feeds, two and three Finger Stripers, Pattern Wheels, Separating Course, and individual stitch adjustments.



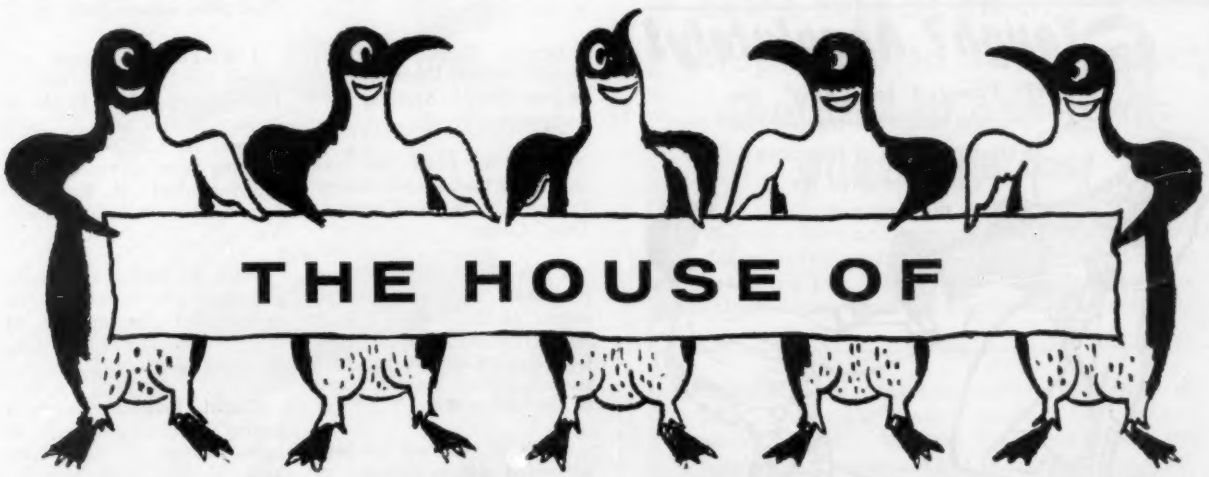
Built Right . . .
to Knit Right



LEIGHTON MACHINE COMPANY

··· MANCHESTER, NEW HAMPSHIRE ···

MFGRS. OF CIRCULAR LATCH NEEDLE KNITTING MACHINES



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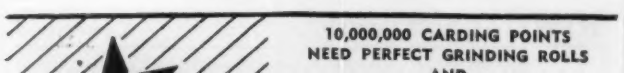
Consult your local dyestuff distributors for information and samples. Shipments can be made from our Baltimore factory.



How Metallizing saves money in textile mills

cuts machine repair costs 80%—
cuts equipment "down-time"—
permits reduced spare parts stocks

Practically any worn machine part—repaired for only 15 or 20% of replacement cost—in minutes and hours, instead of days or weeks.

Worn Equipment and Parts

Drive shaft journals	Top rolls, necks and centers
Roll journals and surfaces	Slasher roll surfaces and journals
Spindle tops and whorls	Blanket roll journals
Calender rolls and journals	Sand roll surfaces and journals

The list of metallizing users in the textile field reads like a Blue Book of the industry. Here are just a few:

Cannon Mills	Deering-Milliken	Bib Mfg. Co.
Dan River Mills	Greenwood Mills	Bruck Mills (Canada)

For further information see our 8-page Bulletin in Sweet's File for Plant Engineers, or write for special free bulletin "Whip Waste with Metallizing in Textile Plants."

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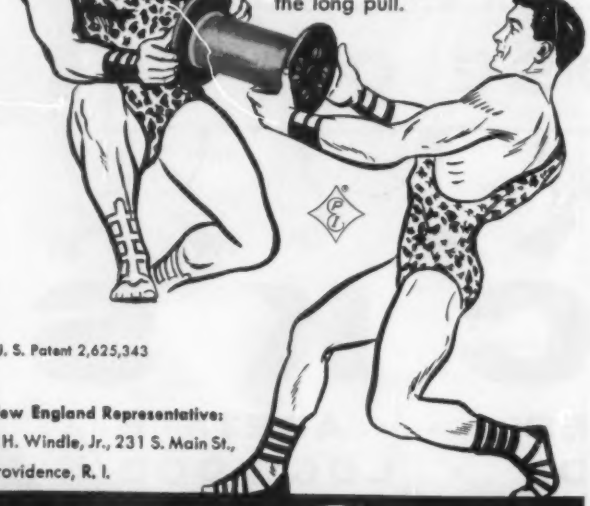
Tough? Absolutely!

EPI Patented Lock Ring* construction resists the tremendous crushing force of tenacious yarns. Designed for the long pull.



*U. S. Patent 2,625,343

New England Representative:
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INCORPORATED
Gibsonville, North Carolina

NEWS about MEN

Marion Beacham has been named division manager of the Amerotron Corp. plants at Barnwell, S. C., and Tifton, Ga.

Henry J. Bell and **Frederick C. Eaton** have retired as vice presidents and directors of Fruit of the Loom, Inc., Pontiac, R. I. **Shirley D. Gardiner** has retired as secretary and treasurer.

Norman Blackledge has been named production manager for all the Southern mills of American Thread Co., New York, N. Y. **R. M. Garrett** has been named assistant manager of the Sevier, N. C., plant of the company.

Dewey Cates has been named general superintendent of the Sisters Knitting Co., Greensboro, N. C.

Harold L. Clark has been elected to the board of Cluett, Peabody & Co., N. Grosvenor Dale, Conn.

Clyde C. Cobb has been promoted to managerial assistant of the cotton mill of Riegel Textile Corp., Trion, Ga. **R. E. Coleman** has been named general superintendent of the cotton mill.

James W. Corbett has been appointed office manager of the Dunean Plant of the Synthetics Div. of J. P. Stevens & Co., Inc., Greenville, S. C.

W. W. Couch has resigned as vice president of Durham Hosiery Mills, Durham, N. C.

Melvin R. Croll has been elected a vice president of Springs Cotton Mills, Lancaster, S. C.

Miss Maria Doukas has been appointed assistant secretary of Bates Mfg. Co., Lewiston, Me.

GEORGE W. PIERCE has been appointed executive director of the tricot and circular-knit finishing division of American & Efird Mills, Mount Holly, N. C.

J. P. Foster has been promoted to assistant superintendent of the Fieldcrest Mills, Inc., blanket mill, Draper, N. C. **Walter Danhoff** has been appointed night superintendent of the company's towel mill in Fieldale, Va.

John F. Fowler has been named director of research and new-product development at P. H. Hanes Knitting Co., Winston-Salem, N. C.

Gerald Frankel has been named a vice president of Julius Kayser & Co., New York, N. Y.

William S. Garner has been promoted to overseer of the card room at the Monarch Plant of Monarch Mills, Union, S. C. At the company's Ottaray Plant in Union, **Jesse P. Walker** has been named overseer of the card room and **Harold Hulon** has been named spinning-room supervisor.

J. W. Gilreath has been named plant manager of E-Z Mills, Inc., Cartersville, Ga.

Virgil Hampton has been

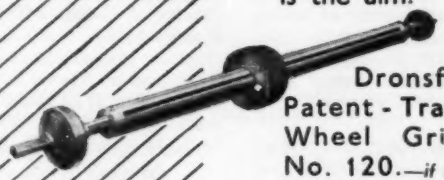
NEWS ABOUT MEN Continued

10,000,000 CARDING POINTS NEED PERFECT GRINDING ROLLS AND

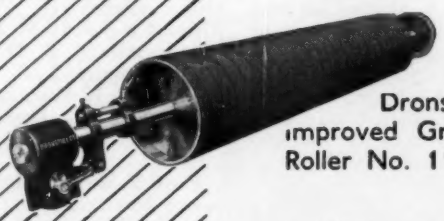
CARD GRINDING WITH ABSOLUTE ACCURACY

DRONSFIELD'S PATENT MOTOR-DRIVEN FLAT SURFACE GRINDING MACHINE No. 241.

Designed for grinding revolving flats—four simultaneously—dismounted from the cards. Absolute precision in setting is the aim.



Dronsfield's Patent - Traverse Wheel Grinder, No. 120.—*if requested can be supplied fitted with ball bearings.*



Dronsfield's improved Grinding Roller No. 112.

Made by

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TRADE MARKS:
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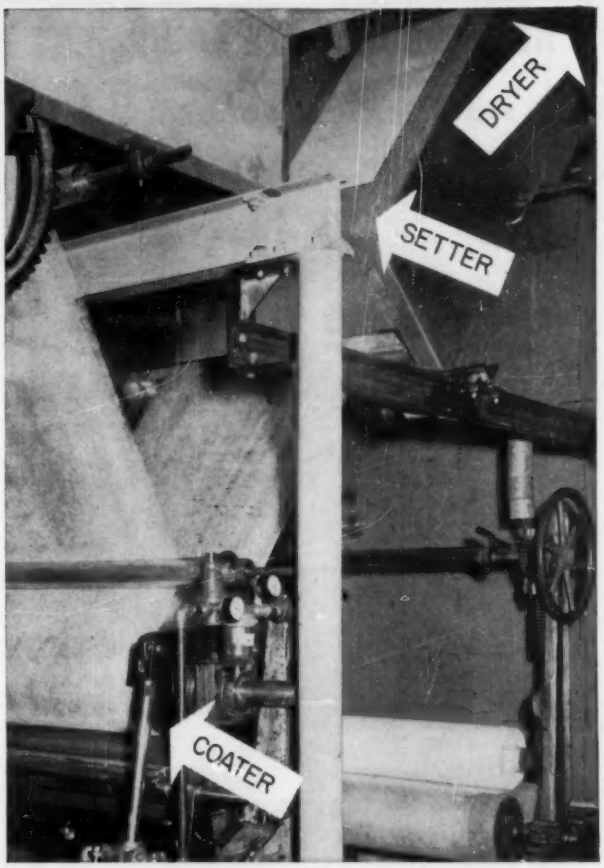

Three feet of electric heat adapts line to new product, operates at one-tenth allowable cost

To produce a new non-woven cotton fabric, roll-coated with polyvinyl chloride required additional heat capacity on the drying line. The cost of extending the line was prohibitive when other heat sources were studied.

SOLUTION: Intense, uniform Far-infrared heat. Three Chromalox radiant heat panels work perfectly at less than one-tenth the acceptable power cost of $.003 per square yard. Only minor alterations were necessary to the existing line. Setting time for coating was maintained at two seconds.

Chromalox Far-infrared panels are completely packaged modular units ready to hook up on circuits up to 600 V. Write for full details.

FREE—Bulletin CS-606 ➔

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NEW LABORATORY EQUIPMENT

now being manufactured by

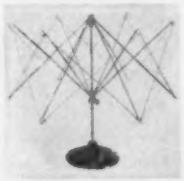
SCOTT TESTERS (SOUTHERN), INC.

STANDARD 36" ROVING REEL

The Standard Hand Operated, 36" Roving Reel is made of cast metal and is sturdily constructed. Equipped with a yardage counter that is visible at all times. Has an adjustable creel that will take any size card-room bobbin. Painted gray. Weight 42 lb., net.

STANDARD 36" or 54" YARN REEL

Our new Yarn Reel is hand operated and equipped with a direct reading, 3 digit counter. It is of rugged construction although light in weight. Traverse is adjustable and produces 4 skeins in one operation.



STANDARD UMBRELLA REEL

This Skein Reel will hold skeins up to 72". It is invaluable for winding and examining yarns in skein form.

STANDARD YARN EVENNESS CONTROLLER

(Yarn Examining Machine)

Hand operated with 5 speeds that control yarn spacing. Has adjustable tension stand and supply attachment for bobbins or cones. Complete with card rack and 50 black boards, 10" x 5½".

SCOTT TESTERS (SOUTHERN), INC.

Box 834, Spartanburg, S. C. or through mill supply houses.

Novelty Yarns

Any construction to your specifications using any fiber for Men's Wear, Dress Goods, Upholstery, Draperies, Automotive, and so on. Twists, Boucles, Ratines, Knots, Nubs ——

Neva-Tarn

Metallic Yarns

Non Tarnishing Metallics, all constructions of supported yarns on disposable tubes or cones for Knitting and Weaving into all types of fabrics. Additionally — Metallics combined with Novelties.

THE *Montgomery* COMPANY

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RAYON PLANTS & TEXTILE MILLS

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- ***DESIGN***
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- ***MANAGEMENT***

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named assistant manager of the Fairfax Mill of West Point Mfg. Co., Fairfax, Ala.

David L. Haskell and **A. Wilcher** have been named vice presidents of Tennessee Knitting Mills, Inc., Columbia, Tenn.

Edward J. Hoechst has been named director of industrial relations at Fieldcrest Mills, Inc., Leaksville, N. C.

John C. Hughes has rejoined the board of the Graniteville Co., Graniteville, S. C.

James J. Jester has been promoted to superintendent of weaving, slashing, and the cloth room at the Trion, Ga., division of Riegel Textile Corp.

William R. Johnston has been elected a vice president of Associated Textiles of Canada Ltd., Louiseville, Que.

Paul Jones has been elected vice president of Peerless Hosiery Co., N. Wilkesboro, N. C.

Eugene C. Kahanek has been named overseer of carding at French Worsted Co., Woonsocket, R. I. **Henry T. Dogue** has been named overseer of worsted combing.

Frank B. Mayer has been appointed a vice president of Rose Mills, Inc., Philadelphia, Pa.

Walter S. McPhail has been named assistant vice president of Wamsutta Mills, New Bedford, Mass.

Alfred Mello has been named overseer of throwing at Clearview Textile Corp., Scranton, Pa.

Harold G. Miller has been named vice chairman of the board of Vanity Fair Mills, Reading, Pa. **Robert J. Andrews** has been named president to succeed Mr. Miller.

James M. Mitchell, Jr., has been named quality-control manager of Avondale Mills, Sylacauga, Ala. He succeeds **Gardner M. Hailes,** resigned.

Harvey T. Phillips has retired as secretary of Montgomery Knitting Mills, Summerville, Ga. **J. R. Burgess** has been named vice president and general manager. **Irvin Thomas** has been named secretary and **Mrs. Cleland H. Echols** has been named treasurer and office manager.

Clarence S. Puglen has been named plant manager of the Axminister Div. of Hightstown Rug Co., Hightstown, N. J. **Frederick T. Davis** has been named plant manager of the Velvet Div.

Abe Raffelock has been named to head the gray-goods division of Verney Corp., Manchester, N. H.

Paul A. Redmond, Jr., has been named president of Alabama Mills, Inc., Birmingham, Ala. Others elected are: **A. H. Randall,** executive vice president; **Julius E. Chapman,** vice president and treasurer; **J. H. Real,** secretary and treasurer; **Herman E. Robinson,** assistant secretary.

L. W. Robert has been elected chairman of Anchor Rome Mills, Inc., Rome, Ga.

Edward D. Rohrbach has resigned as industrial relations director at Botany Mills, Inc., Passaic, N. J.

Armand St. Martin has been named overseer of slashing and dressing at Lippitt Worsted Mills, Woonsocket, R. I.

James R. Scott has been elected president of Charles H. Bacon Co., Lenoir City, Tenn. Others elected are: **W. V. Kirkland** and **Betty M. Bacon,** vice presidents; **T. D. Lancaster,** treasurer; **J. B. Kizer,** secretary; **C. L. Mize,** assistant treasurer; **M. E. Dexter,** assistant secretary.

Floyd B. Sherwood has been named boss carder at Lobsitz Mills Co., Nutley, N. J.

D. Harvard Smith has been named general manager of the Lindale, Ga., division of Pepperell Mfg. Co.

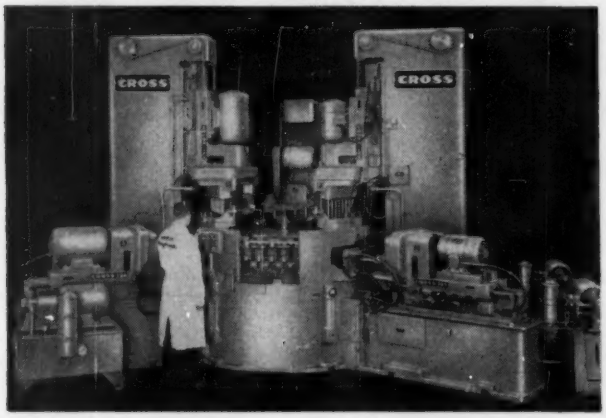
John I. Smith has been promoted to vice president of Renfrew Bleachery, Travelers' Rest, S. C. Other promotions are: **Creighton D. Griggs,** manager; **Ben N. Anderson,** superintendent; **Joseph Y. Brice,** assistant superintendent.

S. Scott Stewart has been named assistant to the presi-

NEWS ABOUT MEN **Continued**

1 NORGREN MICRO-FOG UNIT *lubricates*

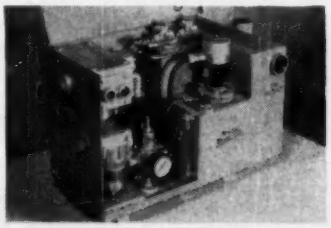
150 ball bearings and 70 spur gears on large automatic machine



If you're looking for more efficient and economical lubrication of textile machine components, the Norgren Micro-Fog Lubrication Systems used on many large industrial machines may supply the answer. The big machine shown above has one compact Norgren Micro-Fog Unit which lubricates 150 ball bearings and 70 spur gears having a total of 525 bearing inches.

This manufacturer uses Norgren Micro Fog Lubrication on many of its automatic machines, with these advantages:

1. Provides a better lubrication system for more efficient machine performance and reduced maintenance costs.
2. The cost of bearing and gear box seals, necessary on recirculating lubrication systems, has been practically eliminated.
3. Ends oil leakage through seals; safer floor conditions exist around the machines.
4. Oil consumption is radically reduced
5. The system of safety alarms on this Micro-Fog Unit ties in perfectly with the built-in monitoring controls of the machine.



Norgren Micro-Fog Lubricator, Model 33AB as used on above machine, has capacity to lubricate 1000 bearing inches.

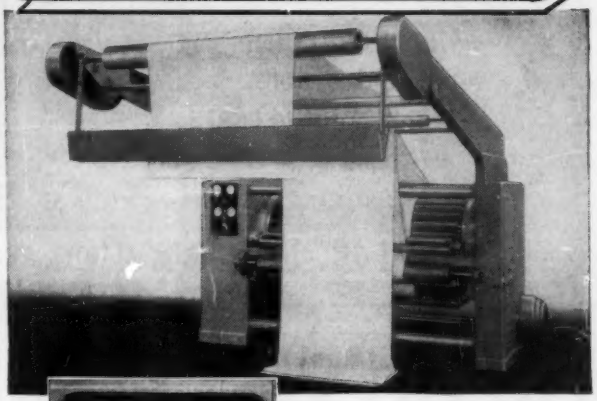
For complete details on this Norgren Micro-Fog application, write for Norgren Blueprint MF 19 or phone the Norgren representative listed in your telephone directory classified section under Norgren Pneumatic Products.

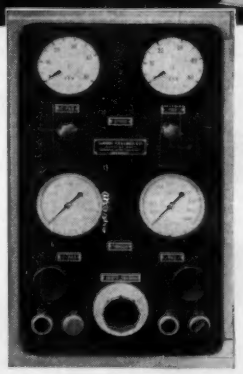
NORGREN
the most complete line of Air Line Lubricators

70 models...3 oz. to 5 gal. oil capacities...¼" to 1½" pipe sizes.

C. A. Norgren CO.
3404 So. Elati, Englewood, Colo.

Hi-Torc Napper production
PLUS smoothness, PLUS nap density
is hard to believe





Even seeing Gessner's Hi-Torc Napper operating at four times a normal rate of production, and discovering the smoothness and density of nap obtained — leaves you at a loss for words. Just as amazing is the design of the Hi-Torc which permits exact indication of the napping results and therefore settings which you can, if you want to, duplicate accurately.

If you have heard that Hi-Torc Nappers are scarce, put it down to the demand. Mills who nap are finding that they cannot maintain their competitive position without one of those extraordinary machines.

Just say you would like to see a Hi-Torc Napper in operation. We'll do the rest.

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WORCESTER, MASS.

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NEWS ABOUT MEN — Continued

dent at Philadelphia Penn Worsted Co., Philadelphia, Pa.

Arthur Stowe has been named manager of Fred Whitaker Co., Raleigh, N. C.

James B. Tait, Jr., has been elected president of Rock River Woolen Mills, Janesville, Wis. **Alfred A. Guidotti** has been named vice president and general manager, and **T. Clifford Peacock** has been named secretary-treasurer. **H. S. Lovejoy** and **P. J. E. Wood** have been elected to the board.

Joseph W. Valentine has been elected chairman of Texas Textile Mills, Dallas, Tex. **Bryan C. Miller, Sr.,** has been elected president. Other officers elected are **Darrell E. Knox,** secretary-treasurer, and **Carl C. Buchanan,** assistant secretary and comptroller. **O. B. Haney** has been named manager of the company's mill at Waco, and **Frank W. Smith** has been named manager of the McKinney mill.

Fred Waltz has been named superintendent at Ponemah Mills, Taftville, Conn. He succeeds **R. G. H. Knight,** retired.

W. D. Ward has been named card-room overseer at American Thread Co., Newnan, Ga. **Richard Carroll** has been promoted to shift foreman in the card room.

W. J. Welborn has been named general assistant superintendent of the dyeing and finishing plant of Riegel Textile Corp., Trion Div., Trion, Ga. He succeeds **J. H. O'Neill,** who has been named chief chemist at the central control laboratory at Ware Shoals, S.C.

W. T. White, O.B.E., has been appointed to the board of Stanfields Ltd., Truro, N. S.

John R. Williams has been named superintendent of the Burlington Mills Corp. Modena Plant, Gastonia, N. C.

Marvin Williams has resigned as overseer of carding at Ski-Land Woolen Mill, Clinton, Me.

OBITUARY

David Clark, 78, chairman of Clark Publishing Co., Charlotte, N. C.

Harold S. Dickstein, 33, secretary of National Piece Dye Works, Inc., Long Island City, N. Y.

Ralph C. Edwards, 51, night superintendent of Exposition Cotton Mills Co., Atlanta, Ga.

Henry A. Henegar, 53, vice president and assistant general manager of Standard Knitting Mills, Knoxville, Tenn.

William Hurtz, 55, superintendent of Monroe Silk Mills, Stroudsburg, Pa.

William L. Kelleher, Sr., 75, assistant superintendent of Duffy Silk Co., Buffalo, N. Y.

Murrell A. Land, 66, retired engineer of Westinghouse Electric Corp. at Greensboro, N. C.

Albert C. Marble, 88, board chairman of Curtis & Marble Machine Co., Worcester, Mass.

William H. Mitchell, 81, retired card-room overseer for Fitchburg Yarn Co., Fitchburg, Mass.

Fred H. O'Hara, 70, former president of Norwich Mills, Inc., Norwich, N. Y.

Byron A. Rath, vice president of Rose Mills, Inc., Philadelphia, Pa.

Arthur B. Robertshaw, 80, former president of Woonsocket Falls Mill, Woonsocket, R. I.

Roger J. Rock, 81, former treasurer and member of the board of Oneita Knitting Mills, Utica, N. Y.

Harvey E. Sims, treasurer and a director of Atlas Underwear Co., Piqua, Ohio. Mr. Sims was a member of the board of the Underwear Institute, New York, N. Y.

Robert J. Stephenson, Jr., executive vice president of Southern Bleachery & Print Works, Taylors, S. C.

D. S. Tysinger, 60, secretary of Rowan Cotton Mills, Salisbury, N. C.

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Will this blot spread... or shrink?

NOTHING STRIKES so brutally at human lives as a slum.

Yet of America's many millions of homes, the blot that is a slum covers more than 1 out of every 10 . . . and nearly one-half of all our homes are urgently in need of repair and basic improvements.

Will the blot go on spreading? Or will a concerted, nationwide attack on the causes of slums shrink it, year by year, until it is wiped out? Today, this is a challenge to every American . . . a challenge that *must* be met.

Your community . . . your problem!

A slum reaches across blocks, across miles, to sit on your doorstep and demand a price.

You pay it in the threat of crime and juvenile delinquency to your family. You pay the price in higher personal property taxes to fight the disease and crime and poverty that are slum-bred. You pay personally when the value of your home sinks as community deterioration takes another step closer.

Your *firm* pays when the community where you do business goes downhill. Slums automatically mean lower purchasing power and less effective labor.

Good citizenship is good business

It's good citizenship and good business both for your firm to join efforts to check housing decay . . . to stop slums before they start. In fact, it's the *responsibility* of every business, as it is of every other good citizen, to support community improvement efforts.

Some slums are beyond repair. They should be torn down and a fresh start made. Others can be remodeled, made to conform to better living standards. So it is up to you to get behind every sound program which seeks to provide adequate housing for all our people.

Adding your support to the efforts of the millions already attacking the problem, your firm can help stop slums cold and put America's housing standards at a new height.

How to get into action

A group of Americans from every walk of life has formed a new, non-profit organization to help combat home and community deterioration – The American Council To Improve Our Neighborhoods . . . A.C.T.I.O.N.

Send for a free copy of "ACTION." It explains what A.C.T.I.O.N. is and proposes to do. It also lists booklets, research reports, check-lists, and other material which can help you protect the housing health of your community. Address P. O. Box 500, Radio City Station, New York 20, N. Y.

ACTION

American **C**ouncil **T**o **I**mprove **O**ur **N**eighborhoods

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant
Positions Wanted
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Send NEW ADS to TEXTILE WORLD, 330 W. 42nd St., N. Y. 36, N. Y. for January issue closing December 15th

POSITIONS OPEN

SUPT. large southern cot. mill, salary $15,000-$20,000 yr.; gen. mgr. wln. yarn mill; supt. knit. cloth mill; mgr asbestos mill.

OVERSEERS for finish. woven and knit. goods; wstd. comb.; wln. card.; wstd. spin.; cot. piece goods finish. and other depts.

SPONGING dept. foreman; shoddy-wool salesman; industrial-time study engineers; master mechanics; second hands and fixers all departments.

SEND US YOUR RESUME and we will answer promptly with information on these positions and others equally attractive opening up in the textile industry. All correspondence confidential. No employment fee to be paid unless you accept employment through our Service.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St. Boston 8, Mass.
Phone: Liberty 2-6547
Over 55 Years In Business

Wanted—Raschel

Man who is capable of knitting Raschel laces, Nylon net and has a knowledge of designing. Will have complete charge of department. State experience. Answer, Box 480, Trenton, N. J.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)
LOS ANGELES: 1111 Wilshire Blvd. (17)

POSITIONS VACANT

Wanted—A qualified, experienced superintendent for yarn mill in Ontario, Canada. Producing cotton yarns and some synthetic yarns. Give full details in letter for interview later. Replies confidential. Reply to P-8421, Textile World.

Help Wanted—Male production superintendent for novelty weaving mill in deep south—time study cost control and production planning experience required. P-8428, Textile World.

Tricho Mechanic with knowledge of raschel machines for excellent position in Mexico. Reply Room 1335, 15 Park Row, New York 38, N. Y.

POSITIONS WANTED

Thrower, Supt. or manager. Twenty-five years experience. Throwing of all fibers for all trades, knowledge of modern methods, costs, and incentives. Excellent references willing to relocate. PW-8017, Textile World.

Tricot, simplex, cut-presser designer—full knowledge of chains and cut wheels, 25 years designing experience. PW-8362, Textile World.

Knitter-Mechanic, and machinist, wishes to contact financially strong party for the manufacture of knitted outerwear. Prefer textile man with knowledge of marketing. PW-8367, Textile World.

Dyer—Technician graduate, age 43, immigrant, from Lodr, Poland, desires position in U. S. A. Languages: sufficient English, fluent German, Polish. Over 20 years experience on cotton, rayon, synthetics, in all production phases, especially vat and naphtol—dyes on yarns in dyeing-machines. Present working for a dyehouse of nylon-rayon laces, nets and knittings in Quebec. Willing to go anywhere and to accept trial arrangements. PW-8422, Textile World.

Ambitious young man, thirty-one, seeks position as designer or assistant superintendent in worsted mill. Knowledge of mill operations including laboratory work. 10 years experience. Resume upon request. PW-8196, Textile World.

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Please write complete details of background and experience, including initial salary requirements, to J. A. Berg. All inquiries in confidence.

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2. PhD or equivalent in physical chemistry, 5 to 8 years experience, some of which should have been in fiber research. To assist in planning and coordinating problems in basic fiber research covering relationship of molecular and micro structure to mechanical, thermal and other physical properties.

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Morris Court Summit, New Jersey

NEW AMERICAN MILL IN BRAZIL
Requires Synthetic Loomfixers and Teachers

Wanted Two Draper XD Loomfixers and One Crompton & Knowles W type Loomfixers will be required to fix and to teach local help. Knowledge of Portuguese or Spanish a help but not a necessity. Mill is located in large modern city, good living conditions. Mill will pay all travel expenses men and families to Brazil plus customary foreign service arrangements. Excellent opportunity for right men to join a new, growing organization. Applicants should have a broad knowledge of fixing on spun synthetics and wool blends. Knowledge of filaments a help but not a necessity.
Write full details to

P-8384, Textile World
330 W. 42 St., New York 36, N. Y.

NEW AMERICAN MILL IN BRAZIL
Requires Overseer of Slashing of Spun Synthetics

Wanted a Slasher Overseer, well experienced in Slashing Spun Synthetics on American equipment for new mill located in large, modern city in Brazil. Position covers Slashing, Quilling, Drawing-In, Coning and Warping of Spun Synthetics and Wool Blends. Wonderful opportunity for right man to join new and progressive company. All travel expenses for man and family paid plus customary foreign service arrangements. Must be willing to train new unexperienced labor. Knowledge of Portuguese or Spanish a help but not a necessity. Write full details to

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Salary is open.

This is a permanent position in the conveniently located New York City Offices of this well-known major company. A comprehensive benefit program is available to all employees.

Please send resume stating qualifications, background and salary requirement in confidence to:

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FOR SALE - PARTIAL LIST

125—New ROVING CANS, Plastic Coated, 35¼" x 15½" I.D.
4—D&F iron single cylinder 60" x 60" CARDS, Breast Sections, Hopper Feeders.
4—Whitin Cashinko single cylinder 60" x 54" CARDS, Breast Sections, Hopper Feeders, V-belt M.D.
1—D&F CARD CLOTHING TENSION MACHINE for 60" Card.
2—Hadley Spinning Roll Parchment COVERING MACHINES.
2—Hadley Spinning Roll CLEANING MACHINES, with circular wire brushes.
20—Schlumberger Delete Wool COMBING MACHINES, Aprons 12¾" width.
2—D&F Tape CONDENSERS, 60" single rub, 4-bank, 96-120 end.
1—Hydrolit Portable Yarn CONDITIONER, with 2 Extractors.
1—R&L Fleetline Yarn STEAMING & CONDITIONING MACHINE with foxboro Controls, S. S. lined, holds 4 trucks.
5—McBride Steel CREELS, 42 ends, Pigtail Guides.
1—D&F Wet DRESSER, 7-pass unit.
1—P&S Wet Stock Picker FEED 45".
3—Whitin 48" Intermediate Broadband FEEDS, J-1 Card Conveyor, F-1 Feed Tables.
2—P&S 2 cylinder GARNETTS, 20" x 60" double doffer.
2—D&F 60" Card Traverse GRINDERS, sleeve bearing.
4—C&K W-3 automatic LOOMS 76", with multipliers, mtrzd.
36—C&K Veri-best automatic 82" LOOMS, mtrzd.
24—C&K Automatic W-2-82" LOOMS, mtrzd.
32—C&K Automatic W-3 - Worsted 82" LOOMS, mtrzd.
1—C&M MIXING PICKER, 12 bar, 48".
1—D&F Iron Fearnaught MIXING PICKER 48" x 54" dia. cyl.
1—Suter Skein Yarn REEL, 6 fly, holds 10 skeins, mtrzd.
1—Toledo no-spring Cloth SCALE, 180 lb. cap.
1—S&F GARNETT SHREDDER 60", metallic clothing.
1—G&Y Roving Spool STRIPPER for Spools 56".
1—Terrell automatic Bobbin STRIPPER, Model L, mtrzd.
1—Scott YARN TESTER, Model X5, mtrzd.
1—B-C Model K Portable WARP TYING MACHINE.
1—B-C Model 8E WARP TYING MACHINE.
1—D&F 80" WARPER, Brass Heavy Type Pinning Plate Rails.
1—Whitin Model MS FILLING WINDER, 36 spdls.
2—Foster Model #102 TUBE WINDERS, 80 spdl. units.
2—Foster Model #102 CONE WINDERS, 80-88 spdl. units.
2—Universal Model #80 CONE WINDERS, 14 spdl. each.

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4—60" Carbomatic gas fired infra-red Burners complete with motor, blower and controls.
1—SS Cook PN Detwister with MD.
1—SS 225 Gal. Mixing Tank 3'x3'x3½' deep.
1—66" Birch Bros. Scutcher.
1—66" Parks & Woolson double Shearing Machine.
1—72" James Hunter—4 Pass Pin Dryer complete.
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46 Saco-Lowell 224 spindle spinning frames, tape drive, Roth long draft, 2¾" gauge, 1 7/16" ring, VR 3 shift clocks.

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5—NEW Whitin Schweiter MS Filling Winder Spare Heads.
2—Frames Whitin Worsted Ring Rovers 40 Spdles each 7½ G x 5½ R. Tape Drive, 10 x 5 Spools, 350-V Mtr.
24—Bahnson H.S. Humidifiers, J-controls, 220-V Mtrs.
250M—6" Auto Loom Bobbins—like new.
3M—80" Harness Frames, combination ends—for 14" Heddles.
950M—St. Steel 13" Duplex Heddles—excellent.
5—Factory Rebuilt (1955) #50 Coners-pineapple attachments.
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Partial Listing:

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14—Warner-Swasey Weaving Machines, 80", 8 harness,—1950.
9—S.L. Twisters, 200 spdls., 3" ri., 4" & 5" ga., tape drive.
166—C & K W2 Looms, 82", 20 harness dobby, M. D.
1—Bachmann-Uxbridge Air Slasher, Model A, 80",—1950.
4—Whitin-Schweiter Winders, 24 spdls. each,—1045.
6—Riggs & Lombard S. S. Closed Dye Boxes, 6' wide, 1948,—52.
1—Birch Open Width Washer, 5 compts., 82" wide.
1—Arlington S. S. Open Width Washer, 4 compts.,—1950.
1—Kenyon Pin Tenter Dryers, 40' long x 84",—1947.
1—Parks & Woolson Gap Shear, 72" wide,—1948.

RAYLAINE MILLS, INC.
Manchester, N. H.,
Spinning, Weaving and Warping

39—Whitin & Lowell Cotton Cards, 40", 27" doffers.
1—Abington Card Stripping System, 25 HP,—1947.
3,000 Spdls.—Whitin Tape Drive Spinning Frames, Model F 3¼" ga., 2" ri., 39" frame.
2—S.-L. Tape Drive Ring Twisters, 4½" ga., 3½" ri., 104 spdls. ea.
132—Spdls—Whitin-Scheweiter Winders, 12 spdl. Secs.,—1945.
1—Bachmann-Uxbridge Air Slashers, Model A, 80", D.C. drive,—1950., Reliance drive.
24—C & K W3 Looms, 82", harness,—1954.
24—C & K W2 Looms, 82", 20 harness, —1931.

CLUETT, PEABODY & CO.
North Grosvernordale, Conn.,
Spinning & Weaving

2—S.-L. #7 Two-Bag Air Filters.
4—S.-L. Single Process Pickers, 3 Beaters, 3 #5 Air Cleaners.
56—H & B 40" Cotton Cards, 26" doffer.
46—Del. S.-L. Controlled Draft Drawing —1952.
4—S.-L. Model 37 Lap Winders,—1949.
33—S.-L. Double Head Combers, 12 heads ea., age 1941.
26,000 Spdls.—H & B Spinning Frames.
1—Barber-Colman Quiller, 30 spdls., Model EBW,—1949.
6—Foster Model 102 Winders, 100 spdls. ea., w/Springs.
2—Bachmann Uxbridge Gentle Air Slashers, 60" headway—1952.
1—Manton Gaulin Homogenizer, Type 300, CGD,—1949.

BARBET MILLS
Lexington, N. C.,
Spinning, Knitting, Dyeing & Bleaching

1—S.-L. Single Process Picker, 40" wide.
35—H & B Cotton Cards, 40" wide, B-B Comb Boxes.
6—Mason Cotton Cards, 40" wide, B-B Comb. Boxes.
2—Universal Rotoconers, Model #44, 120 spdls.—1941.
2—Hinn. Stainless Dye Boxes, 2-12;—1950.
1—Greenville S. S. Bleaching Unit—1950.
5—Supreme MJ Knitting Machines 20" —4—22" Cut; 1—20" Cut.

GOSNOLD MILLS
New Bedford, Mass.,
Spinning & Weaving

23—H & B Cards, 40" wide, 26" doffer, 12" coiler, 110/120 wire.
80—H & B Spin. Frames, Whitin Long Draft, 3" & 2¾" ga.—1948.
46—C & K C6 Looms, 60" cloth, 4 x 1 box, dobby,—1946.

Detailed Catalogues and Descriptions Will Be Mailed Upon Request

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TEXTILE EQUIPMENT COMPANY
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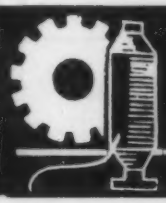

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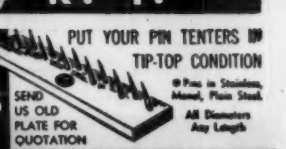

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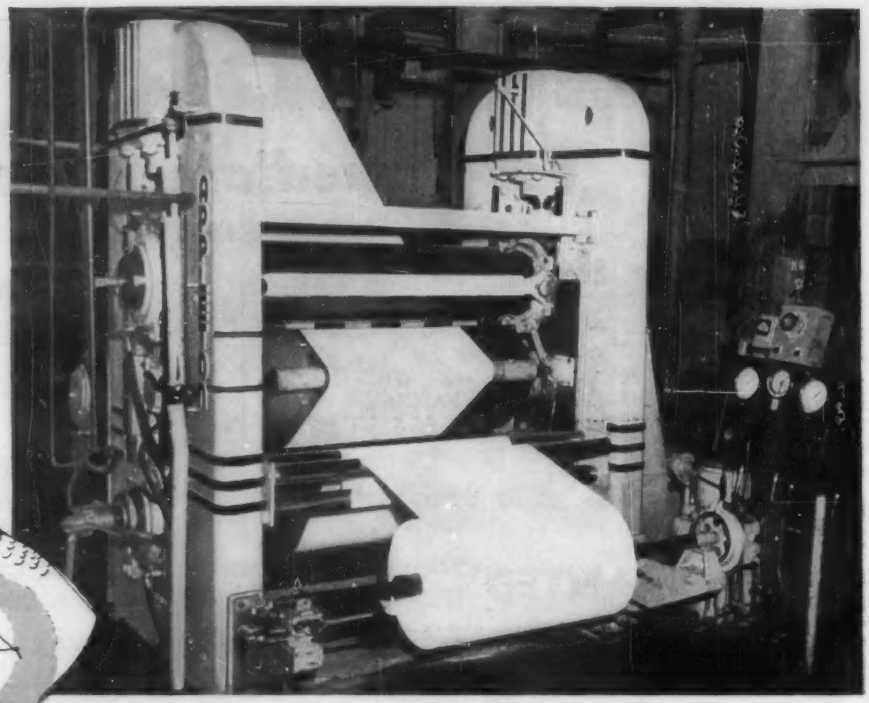
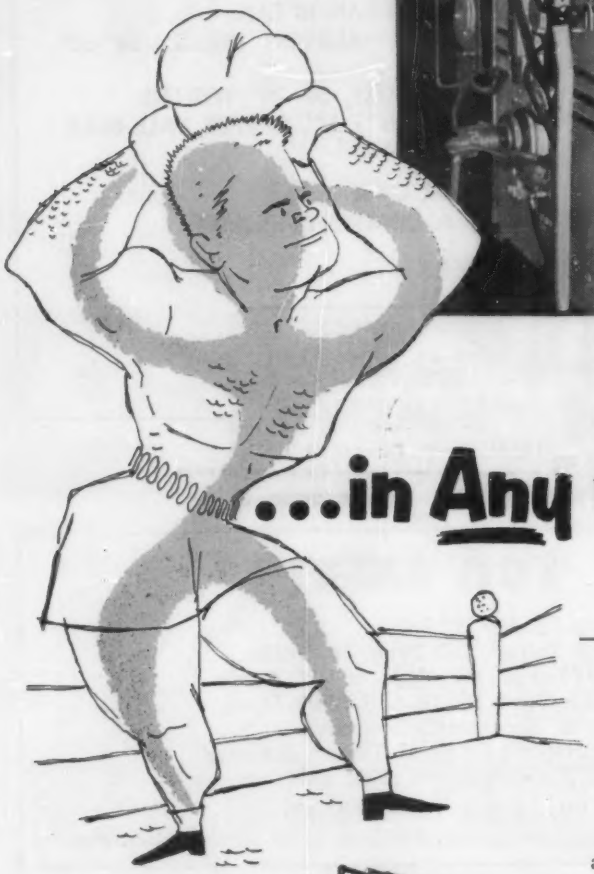


Here is an 80 Ton Appleton 3 Roll Calender in operation



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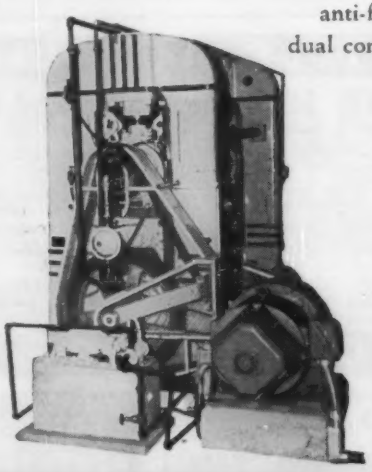

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Corn Products Refining Co.	226	C
Courtaulds, Inc.	186-187	G
Crane Co.	40	H
Crompton & Knowles Loom Wks.	13	R
Crompton-Richmond Co., Inc.	249	N
Crucible Steel Co.	209	O
Dary Ring Traveler Co.	228	T
Dayton Rubber Co., The Textile Div.	24-25	RT
Deutscher, Spinnereimaschinenbau Ingolstadt	21	T
Dodenhoff Co., Inc., W. D.	198	R
Dodge Mfg. Corp.	36	Q
Dolge Co., C. B.	224	B
Dow Chemical Co.	221	C
Draper Corporation	1, 197	H
Dronsfield Bros. Ltd.	257	T
duPont de Nemours & Co., E. I. Dyes & Chemicals Div.	51	C
Durant Mfg. Co.	214	K
Economy Baler Co.	261	P
Emkay Chemical Co.	248	C
Engineered Plastics, Inc.	256	T
Ets Neu	52	A E
Fairchild Engine & Airplane Corp. Speed Control Div.	35	F
Fairtex Corp.	36	G
Faultless Caster Corp.	200	P
Felters Co., The	8	L RT
Foster Machine Co.	157	T
Franklin Process Co.	61	G
Gardner-Denver Co.	39	H
Gastonia Textile Sheet Metal Work	271	T
Gaylord Container Corp.	195	P
General Dyestuff Co.	217	C
General Electric Co.	63-66	F Q
Gessner Co., David	259	E
Goodrich Chemical Co., B. F.	22	C
Gulf Oil Corp.	49, 62	M
Gurley, W. & L. E.	246	K
Harshaw Chemical Co.	229	C
Haskell-Dawes Mach. Co., Inc.	214	T
Hayes Industries, Inc.	218	R
Herman Machine Co.	208	E
Hinde & Dauch	15	P
Hungerford & Terry, Inc.	254	B
Hunt Machine Co., Rodney	77	E
Hunter Machine Co., James	73	E
Huyck & Sons. F. C Noone Ind. Fabrics Div.	250	E
Hyatt Bearings Div., General Motors Corp.	179	O Q
Ideal Industries, Inc.	227	T
Industrial Brush Co., Inc.	253	E
Industrial Rayon Corp.	16-17	G
Industrie-Werke-Karlsruhe	274	E
International Business Mach. Corp.	30	N
Jacquard Knitting Mach. Co., Inc.	2	L
Jenkins Bros.	57	H
Jenkins Sons Inc., M. W.	185	E
Johnson Corp., The	252	H

Keever Starch Co.	225	L
Kennett Equip. & Machry. Co.	210	P
Kidde Mfg. Co.	50, 247	L R
Kuljian Corp., The	258	M
Laurel Soap Mfg. Co., Inc.	206	C
Lazenby Co., The F. A.	224	T
Leighton Machine Co.	255	L
Leyland Machry. Co., Inc., Thomas Div. of James Hunter Mach. Co.	73	E
Link-Belt Co.	7	Q
Loper Co., Ralph E.	260	N
Main, Inc., Chas. T.	260	N
Malina Co.	240	G
McBride, Edward J.	6	R
Marshall & Williams Corp.	273	E
Metallizing Engineering Co., Inc.	256	O Q
Micro Switch Div.	245	F
Miller Fluid Power Co.	72	E H O
Minneapolis-Honeywell Reg. Co. Industrial Div.	190-191	K
Micro Switch Div.	245	F
Monsanto Cemical Co. Plastic Div.	71	C
Montgomery Co., The	258	G
Mortell Co., J. W.	250	B
Morton Salt Co.	193	C
Mount Hope Machinery Co.	165	E
Muller, Franz	253	E
National Aniline Div., Allied Chem. & Dye Corp.	33	C
National Ring Traveler Co.	20	T
National Starch Prods. Inc.	199	C
New Departure Div. of General Motors Corp.	11	O Q
N. Y. & N. J. Lubricant Co.	212	M
Nitrogen Div., Allied Chem. & Dye Corp.	203	C
Noone Industrial Fabrics Div. F. C. Huyck & Sons	250	E
Norgren Co., C. A.	259	M
Onyx Oil & Chem. Co.	80-81	C
Ordnance Gauge Co.	212	L
Parks-Cramer Co.	26	A D
Perkins & Son, Inc., B. F.	38	E
Platt Bros. Sales Ltd.	148	T
Pneumafil Corp.	159	T
Potts Co., Horace T. Speedline Stainless Steel Fittings Div.	254	H
Procter & Gamble	182	C
Proctor & Schwartz, Inc.	230	E
Reiner Inc., Robert	241	L
Reliance Elec. & Eng'g. Co.	43	F Q
Rhoads & Sons, J. E.	5	R
Ridge Tool Co.	192	H
Riggs & Lombard, Inc.	46	E
Robbins & Myers, Inc.	223	H
Robert & Co. Associates	2nd Cover	N
Roberts Co.	9	T
Rohm & Haas Co.	174	C
Ryerson & Son Inc., J. T.	206	O
Saco-Lowell Shops	28, 150	T
Sargent's Sons Corp., C. G.	202	E
Scott Testers Inc.	258	K
Scragg Ltd., Sydney & E.	54	T
Semet-Solvay Petrochemical Div. Allied Chem. & Dye Corp.	169	C
Shell Oil Co.	55	M
Simco Co., The	261	E L RT
Sinclair Refining Co.	76	M
Societe Alsacienne De Constructions Mecaniques	146	T
Socony Mobil Oil Co., Inc.	59	M
Solvay Process Div., Allied Chem. & Dye Corp.	152	C
Sonoco Products Co.	47	E T

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Southern Shuttles Div., Steel Heddle Mfg. Co.	163	R
Southern States Equip. Corp.	219	Q
Speedline Stainless Steel Fittings Div., Horace T. Potts Co.	254	H
Standard Pressed Steel Co.	252	O
Stanley Works, The	216	K
Steel Heddle Mfg. Co.	163	R
Stop-Motion Devices Corp.	249	I
Stowe-Woodward, Inc.	161	E
Supreme Knitting Mach. Co., Inc.	237	I
Sylvania Elec. Prods. Inc.	58	F
Taylor Instrument Cos.	70	R
Taylor-Stiles & Co.	244	T
Terrell Machine Co., Inc.	67	O
Textile Machine Works	84	I
Textile Recorder Exhibition Ltd.	34	N
Tompkins Bros. Co.	220	I
Torrington Co., The (Needles)	205	I
Turbo Machine Co.	86	T
Union Bag & Paper Corp.	29	P
Unionmatex, Textilmaschinen-Union G. M. B. H.	19	E
U. S. Rubber Co. Mechanical Goods Div.	44	Q
Universal Winding Co.	14, 170	T
Van Vlaanderen Mach. Co.	234	E
Veeder-Root, Inc.	4th Cover	K
Versenes-The Dow Chemical Co.	188	C
Vickers Inc. Div. of Sperry Rand Corp.	53	E H O
Victor Ring Traveler Co.	32	T
Visking Corp.	27	P
WAK Industries	224	K
Warner & Swasey Co.	45	T
Western Felt Works	196	L RT
Westinghouse Electric Corp. Lamp Div.	232-233	F
Micarta Div.	239	O
Whitin Machine Works	78-79	T
Wiegand Co., Edwin L.	257	E
Wiesner-Rapp Co.	23	E
Wildman Mfg. Co.	235	L
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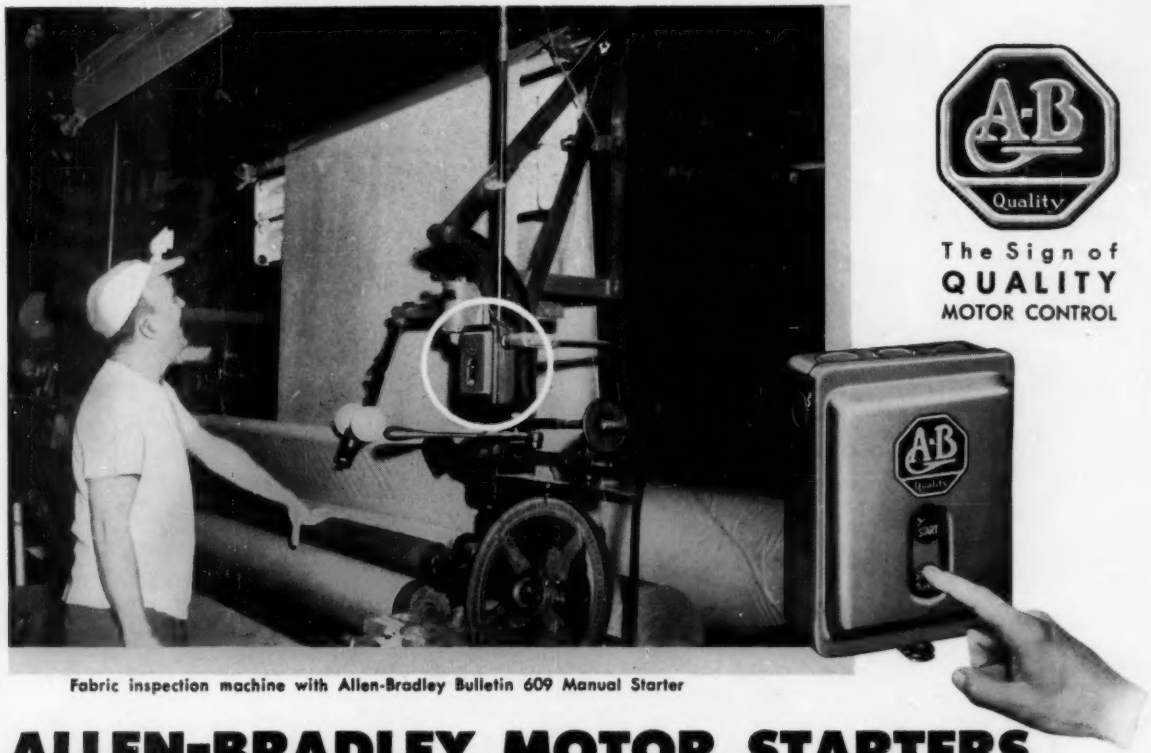

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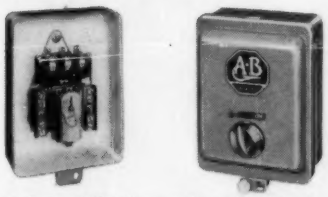

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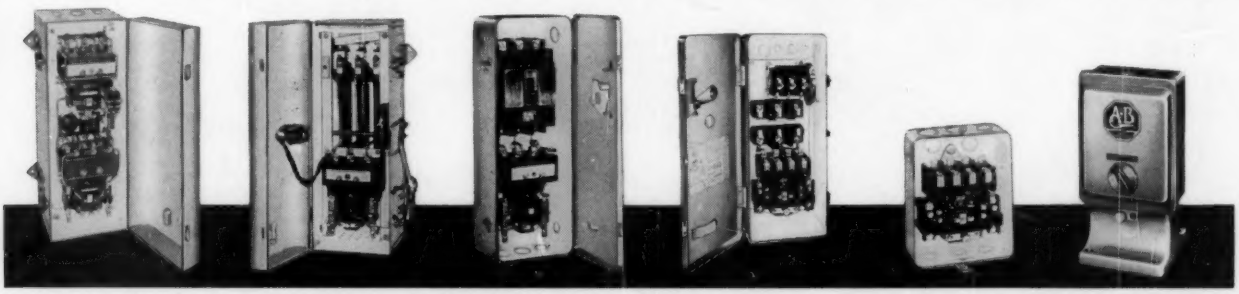

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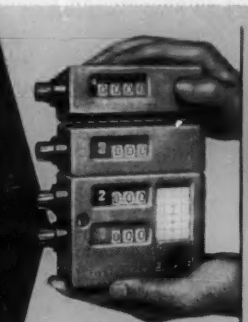

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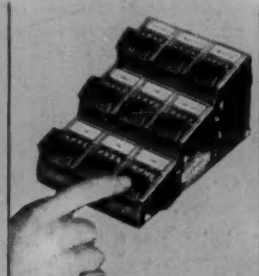

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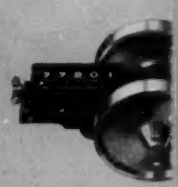

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